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PROCEEDINGS

OF THE

Twenty-Seventh Annual Meeting

OF THE

Georgia State Horticultural Society

HELD AT

Athens, Ga., August 3d and 4th, 1903.

Chartered July 14th, 1876. Organized August 16th, 1876. Reorganized Under New Charter August 1st, 1882.

PRESS OF THE AUGUSTA CHRONICLE,
AUGUSTA, GA.
1903.

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Georgia State Horticultural Society

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PREFATORY.

While the attendance at the Athens meeting of the Society was smaller than usual, the session was nevertheless one of considerable interest and profit.

A number of valuable papers—some of them of marked scientific interest— were read, and several pointed addresses delivered. Among the most important were the following:

"The Georgia Seed Growing Industry"; by Mr. N. L. WILLETT, Augusta.
"President's Address"; by President P. J. BERCKMANS, Augusta.
"Irrigation in Truck and Small Fruit Growing"; by Vice Pres. CHAS. DECKNER, Atlanta.
"Nut Culture in Georgia"; by Mr. HERBERT C. WHITE, DeWitt, Ga.
"The Georgia Fig—Its Possibilities and Promise"; by Prof. HUGH N. STARNES, Biol. & Hort. Ga. Expt. Station, Experiment, Ga.
"The Relation of Bees to Fruit Growing"; by Prof. WILMON NEWELL, Asst. State Entomologist, Atlanta.
"The Relation of Insectivorous Birds to Fruit Growing"; by Col. J. P. FORT, Athens.
"Cold Storage and Export Work with Peaches"; by Prof. S. C. FULTON, U. S. Dept. of Agriculture, Washington, D. C.
"Some Recent Experiments with Insecticides and Fungicides"; by Prof. W. M. SCOTT, State Entomologist, Atlanta.
"Some Lessons Learned the Past Year"; by Vice Pres. G. H. MILLER, Rome, Ga.
"Fertilizers for Orchard and Truck Crops"; by Mr. E. E. EWELL, Atlanta.
"The Relation of the Nurseryman to the Fruit Grower"; by Mr. CHAS. T. SMITH, Concord, Ga.

Probably the most noteworthy feature of the session was the evidence of a distinct awakening of public interest in the matter of the protection of our insectivorous and weed-seed eating birds. Sentiment seems to be at last strongly crystalizing in this direction. This was proved not only by the enthusiastic reception accorded Col. J. P. Fort's address on this subject, but also by the immediate fruit it bore in the prompt organization of a Georgia branch of the National Audubon Society by the members present, with an enrollment of over 50 names.

The esteem, respect, confidence and affection in which Entomologist Scott is held by the Georgia fruit growers was shown by the earnest effort made by the Society to retain his services for the State. It is a source of deep regret to all that these efforts proved unavailing—Prof. Scott finally deciding that he could not consistently recall his acceptance of the very flattering offer recently made him by the U. S. Dept. of Agriculture. For-

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tunately the interests of the fruit growers are left in able hands, as Prof. Wilmon Newell, Asst. Entomologist, becomes, by Prof. Scott's resignation, Entomologist.

H. N. Starnes, Biologist and Horticulturist of the Georgia Experiment Station, was made Secretary of the Society in Prof. Scott's place. President. P. J. Berckmans, for the 28th consecutive time, was retained, by the unanimous, rising vote of the members, in the office he has so ably filled and dignified, and Mr. Louis A. Berckmans was again re-elected Treasurer.

The retiring Vice Presidents (from the Districts with even numbers) were all, with one exception, re-elected, viz.:

W. D. HAMMOCK, Second District.
HENRY BANKS, Fourth District.
ROBERT E. PARK, Sixth District.
NIEL McINNES, Tenth District.

Prof. H. N. Starnes, former Vice President for the Eighth District., having removed to the Sixth District since the last meeting, was succeeded by Jas. B. Park, of Greensboro.

Prof. J. S. Newman, of Clemson College, S. C., was added to the roll of Honorary Members.

The Committee on Necrology reported, since the last meeting, the death of two of our members: J. M. Reynolds, of Mayfield, Ga., and S. R. Wiley, of Macon.

Tallulah Falls was selected as the place for the next meeting of the Society—the exact date of the session being left, as usual, to be fixed by the President.

HUGH N. STARNES,
Secretary.

CONSTITUTION.

ARTICLE 1. The name of this Association shall be the Georgia State Horticultural Society.

ARTICLE 2. Its objects shall be the advancement of the science of Pomology, Floriculture, Arboriculture, and Kitchen vegetable growing.

ARTICLE 3. Its members shall consist of Annual and Honorary members; the latter shall be elected by ballot at the annual or semi-annual session of the Society. The annual fee shall be $2.00.

ARTICLE 4. The meetings shall be held at such times and places as may be designated by the Society, and special meetings may be convened at any time on the call of the President.

ARTICLE 5. Its officers shall consist of a President, one Vice-President from each Congressional District of the State, a Secretary and a Treasurer. The President, Secretary and Treasurer to be elected by ballot at the regular annual meeting, and to serve until their successors are elected and in-

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augurated. The Vice-Presidents all to be elected by ballot at this meeting; those representing districts having odd numbers to serve one year, and those representing districts having even numbers to serve two years—one-half to be elected each year thereafter to serve two years.

ARTICLE 6. The Constitution may be amended at any annual meeting by a two-thirds vote of the members present.

BY-LAWS.

1st. The President shall preside at all meetings of the Society, call meetings of the Executive Committee, and under its direction have a general superintendence of the affairs of the Society, and direction of the expenditures of money. He shall appoint all committees, unless otherwise ordered.

2d. In case of death or inability of the President, his official duties shall devolve upon such one of the Vice-Presidents as may be elected by ballot.

3d. The Vice-Presidents shall, by correspondence and personal intercourse with the fruit growers and horticulturists of the various counties of their respective districts, endeavor to organize local Societies. They shall appoint four members of their Congressional District, and with their aid prepare and forward to the Secretary before or at every annual meeting of the Society such reports as have immediate connection with the condition of fruits, progress in their culture, new seeding fruits, or any other topic relating to horticultural progress in their respective districts. These reports are to be condensed by the Secretary for publication.

4th. The Secretary shall attend to all the correspondence of the Society, and with the aid of a reporter keep a record of the transactions of the meetings, and prepare these for publication, subject to the approval of the President. He shall file and preserve all papers and books belonging to the Society.

5th. The Treasurer shall receive and keep an accurate account of all moneys belonging to the Society, disburse the same on the written orders of the President, which he shall retain and file as vouchers. He shall make an annual report to the Society of the receipts and disbursements, which, with the vouchers, shall be referred to a special auditing committee appointed at the annual meeting. Before entering upon his duties he shall give bond to the Society in the sum of one thousand dollars for the faithful performance of his duties, such bond to be approved by the Executive Committee.

6th. The Executive Committee shall consist of the President, Vice-Presidents, Secretary and Treasurer. They shall, subject to the direction of the Society, manage all its affairs.

7th. The following Standing Committees shall be appointed by the

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President immediately after his election, or so soon thereafter as practicable:

A Standing Fruit Committee, consisting of five members. It shall be the duty of this committee to report annually on native and foreign fruits; to examine and, before the close of the session, report on all new seedling fruits that may be exhibited, and to make an *ad interim* report on those that were exhibited in an unripe condition at the meeting of the Society, but had subsequently attained a state of maturity, and on other such seedlings as may have been submitted to their inspection during the Society's vacation.

8th. A Standing Committee on Synonyms, consisting of five members, shall be appointed annually. It shall be their duty to report annually to the Society at its regular meeting.

9th. Standing Committees, to consist of two or more members each, shall be appointed annually upon the following subjects, viz:

Meteorology in relation to Horticulture.
Entomology and Ornithology in their relations to Horticulture.
Ornamental and useful Trees and Plants.
Ornamental Gardening.
Kitchen Vegetables.
Wine Making.
Packing and Shipping Fruits and Vegetables.

10th. A Standing Committee on Transportation, to consist of five members.

11th. Special Committees shall be appointed by the President immediately after the organization of the annual meeting; on Peaches on exhibition during the session; on Apples, Pears and Miscellaneous Fruits; on Grapes and Wines; on Vegetables. It shall be the duty of these committees to make a full and careful report upon each and every individual collection on exhibition, noting their condition and special merits, if any; also, any particular methods of cultivation by which improvements are made evident.

12th. No medal, diploma or money shall be awarded by this Society as a testimonial of excellence for any fruit, plant, flower or vegetable offered for exhibition. The verdict of the Special Committees shall be the highest commendation of the Society.

13th. Vacancies occurring in committees shall be filled by the chairman of each; and in case of his death or inability to serve, his place shall be supplied by the President of the Society.

14th. No person shall be a member or be allowed to participate in the deliberations of the Society who shall not have paid his fees in full before or at the beginning of the session of the Society.

15th. Honorary members shall consist of persons of distinguished merit in horticultural or natural sciences, and non-residents of Georgia. They shall be entitled to all the privileges of the Society without the payment of annual fees, except on questions of finance.

16th. These By-Laws may be altered by a two-thirds vote of the members present.

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OFFICERS.

PRESIDENT

P. J. BERCKMANS ..... Augusta

VICE-PRESIDENTS

1st Congressional District—G. M. RYALS ..... Savannah
2d Congressional District—W. D. HAMMOCK ..... Coleman
3d Congressional District—HENRY A. MATHEWS ..... Fort Valley
4th Congressional District—HENRY BANKS ..... LaGrange
5th Congressional District—CHARLES DECKNER ..... Atlanta
6th Congressional District—R. E. PARK ..... Macon
7th Congressional District—G. H. MILLER ..... Rome
8th Congressional District—JAS. B. PARK..... Greensboro
9th Congressional District—JOHN G. JUSTICE ..... Marcus
10th Congressional District—DR. NEIL McINNES..... Augusta
11th Congressional District—JOHN M. STUBBS ..... Dublin

SECRETARY

HUGH N. STARNES ..... Experiment

TREASURER

LOUIS A. BERCKMANS ..... Augusta

STANDING COMMITTEES.

ON NEW FRUITS.

Hugh N. Starnes ..... Experiment
S. H. Rumph ..... Marshallville
L. A. Berckmans ..... Augusta
H. A. Mathews..... Fort Valley
J. B. Wight ..... Cairo

ON SYNONYMS

Hugh N. Starnes ..... Experiment
Mark Reigel..... Pomona
C. T. Smith ..... Concord
John H. Baird ..... Fort Valley
A. D. Williams ..... Yatesville

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TWENTY-SEVENTH ANNUAL SESSION

ON ORNAMENTAL AND USEFUL TREES

Charles Deckner . . . . . Atlanta
G. H. Miller . . . . . Rome
R. C. Berckmans . . . . . Augusta
M. H. Hopkins . . . . . Louisville
B. W. Hunt . . . . . Eatonton

ON VEGETABLE CULTURE

G. M. Ryals . . . . . Savannah
F. J. Merriam . . . . . Battle Hill
R. H. Warren . . . . . Albany
A. T. Holt . . . . . Macon
J. E. Jackson . . . . . Gainesville

ON PACKING FRUITS AND VEGETABLES

W. C. Wright . . . . . Fort Valley
W. D. Hammock . . . . . Coleman
I. C. Wade . . . . . Cornelia
John T. West . . . . . Thomson
G. H. Miller . . . . . Rome

ON TRANSPORTATION OF FRUITS AND VEGETABLES

John M. Stubbs . . . . . Dublin
G. M. Ryals . . . . . Savannah
W. L. Glessner . . . . . Macon
Dudley M. Hughes . . . . . Danville
C. W. Withoft . . . . . Fort Valley

ON LEGISLATION

Dudley M. Hughes . . . . . Danville
L. A. Berckmans . . . . . Augusta
Henry A. Mathews . . . . . Fort Valley
G. M. Ryals . . . . . Savannah
John P. Fort . . . . . Athens

ON FORESTRY

Alfred Cuthbert . . . . . Augusta
R. J. Redding . . . . . Experiment

ON BIOLOGY

Wilmon Newell, State Entomologist . . . . . Atlanta

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ROLL OF MEMBERS

Of the Georgia State Horticultural Society for 1903.

Alston, N. C. . . . . Richland, Ga.

Baird, John H. . . . . Fort Valley, Ga.
Banks, Henry . . . . . LaGrange, Ga.
Benton, Prof. H. . . . . Clemson College, S. C.
Berckmans, P. J. . . . . Augusta, Ga.
Berckmans, L. A. . . . . Augusta, Ga.
Berckmans, R. C. . . . . Augusta, Ga.
Berckmans, P. J. A., Jr. . . . . Augusta, Ga.
Boone, H. L. . . . . Valdosta, Ga.
Bostock, Samuel . . . . . Beaufort, S. C.
Boyd, W. M. . . . . Adairsville, Ga.
Brown, David . . . . . Albany, Ga.
Buist, H. B. . . . . Rock Hill, S. C.

Camp, J. A. . . . . Moreland, Ga.
Carlton, Mrs. H. H. . . . . Athens, Ga.
Carpenter, S. M. . . . . Moreland, Ga.
Carson, J. M. . . . . Harmony Grove, Ga.
Carter, T. F. . . . . Richland, Ga.
Caston, D. L. . . . . Jackson, Ga.
Chase, H. B. . . . . Huntsville, Ala.
Chase, R. T. . . . . Huntsville, Ala.
Cheatham, E. E. . . . . Savannah, Ga.
Cheatham, R. S. . . . . Savannah, Ga.
Cheney, W. T. . . . . Rome, Ga.
Cobb, Mrs. Lamar . . . . . Athens, Ga.
Crittenden, H. A. . . . . Shellman, Ga.
Cureton, James . . . . . Austell, Ga.
Cuthbert, Alfred . . . . . Augusta, Ga.

Deckner, Charles . . . . . Atlanta, Ga.
Deckner, A. T. . . . . Atlanta, Ga.
Dresser, F. L. . . . . Kewanee, Ga.
Durban, D. P. . . . . Augusta, Ga.

Easterlin, J. J. . . . . Montezuma, Ga.
Ellington, H. M. . . . . Ellijay, Ga.
Ewell, E. E. . . . . Atlanta, Ga.

Farmer, L. R. . . . . Louisville, Ga.
Felton, Charles H. . . . . Sylvester, Ga.
Felton, Wm. H., Jr., ... Macon, Ga.

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Flournoy, O. R. . . . . Fort Valley, Ga.
Fort, John P. . . . . Athens, Ga.
Fraser, Jas. W. . . . . Huntsville, Ala.
Free, James E. . . . . Demorest, Ga.

Gilmore, George . . . . . Warthen, Ga.
Glessner, W. L. . . . . Macon, Ga.
Greene, L. O. . . . . Long Cane, Ga.
Griffing, C. M. . . . . Macclenny, Fla.

Hale, J. C. . . . . Winchester, Tenn.
Hammock, W. D. . . . . Coleman, Ga.
Hatcher, M. Felton . . . . . Macon, Ga.
Heard, E. B. . . . . Middleton, Ga.
Heikes, W. F. . . . . Huntsville, Ala.
Henderson, W. J. . . . . Macon, Ga.
Hendrickson, F. W. . . . . Milledgeville, Ga.
Hickman, Tracy I. . . . . Augusta, Ga.
Higgins, W. F. . . . . Dublin, Ga.
Holt, A. T. . . . . Macon, Ga.
Holt, Miss Ida . . . . . Macon, Ga.
Hood, C. J. . . . . Harmony Grove, Ga.
Hopkins, M. H. . . . . Louisville, Ga.
Hughes, Dudley M., Pres. Ga. State Agr. Society . . . . Danville, Ga.
Hughes, D. G., Jr. . . . . Danville, Ga.
Hunt, B. W. . . . . Eatonton, Ga.
Hyde, Rev. C. H. . . . . Cuthbert, Ga.

Jackson, J. E. . . . . Gainesville, Ga.
Jenkins, S. T. . . . . Cuthbert, Ga.
Jennings, L. B. . . . . Thomasville, Ga.
Jernigan, H. W. . . . . White Plains, Ga.
Johnson, David . . . . . Quitman, Ga.
Johnson, E. S. . . . . Augusta, Ga.
Johnson, J. A. . . . . Albany, Ga.
Jones, G. T. . . . . Fort Valley, Ga.
Jones, W. H. . . . . Fort Valley, Ga.
Justice, J. G. . . . . Marcus, Ga.

Kellar, John . . . . . Fort Valley, Ga.
Knox, J. W. . . . . Duluth, Ga.

Lightfoot, H. . . . . Chattanooga, Tenn.
Logan, J. C. . . . . Rome, Ga.
Long, H. L. . . . . Leesburg, Ga.
Loop, A. I. . . . . Northeast, Penn.
Luke, J. E. . . . . Hazen, Ga.

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Madden, John B. . . . . Concord, Ga.
Magid, L. B. . . . . Tallulah Falls, Ga.
Mathews, H. A. . . . . Fort Valley, Ga.
McInnes, Dr. Neill . . . . . Augusta, Ga.
McRae, W. F. . . . . Fort Valley, Ga.
McRee, E. J. . . . . Kinderlou, Ga.
McWhorter, P. H. . . . . Buckhead, Ga.
Merriam, F. J. . . . . Battle Hill, Ga.
Middlebrooks, J. T. . . . . Northern, Ga.
Miller, G. H. . . . . Rome, Ga.
Miller, J. C. . . . . Rome, Ga.
Moore, B. T. . . . . Marshallville, Ga.
Moore, R. H. . . . . Culverton, Ga.
Mosier, Chas. A., Asst. Hort. Ga. Exp. Station . . . . . Experiment, Ga.

Nelson, W. K. . . . . Augusta, Ga.
Newell, Prof. Wilmon, Asst. State Entomologist. . . . . Atlanta, Ga.
Newkirk, D. S. . . . . Shellman, Ga.
Newton, Dr. E. D. . . . . Athens, Ga.
Niblack, H. R. . . . . Virgil, Ga.
Nixon, G. H. . . . . Augusta, Ga.

Palen, L. W. . . . . Rome, Ga.
Park, R. E. . . . . Macon, Ga.
Peek, S. W. . . . . Hartwell, Ga.
Perdom, I. W. . . . . Sparks, Ga.

Redding, R. J., Director Ga. Exp. Station . . . . . Experiment, Ga.
Riegel, Mark . . . . . Pomona, Ga.
Rogers, Dr. W. L. . . . . Buckhead, Ga.
Ross, Edgar A. . . . . Marshallville, Ga.
Rowland, W. M. . . . . Augusta, Ga.
Ruffin, G. T. . . . . Reynolds, Ga.
Ruggles, F. A. . . . . Dawson, Ga.
Rumph, L. A. . . . . Marshallville, Ga.
Rumph, L. B. . . . . Marshallville, Ga.
Rumph, Saml. H. . . . . Marshallville, Ga.
Rumph, Mrs. S. H. . . . . Marshallville, Ga.
Russell, L. C. . . . . Winder, Ga.
Ryals, G. M. . . . . Savannah, Ga.

Sanders, M. R. . . . . White Plains, Ga.
Scott, Prof. W. M., State Entomologist . . . . . Atlanta, Ga.
Scott, Wm. Walker . . . . . Powder Springs, Ga.
Shanley, J. W. . . . . Pine City, Ga.
Shewmake, Claude . . . . . Atlanta, Ga.
Shewmake, Marshall . . . . . Augusta, Ga.
Shields, J. F. . . . . Thomson, Ga.

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Skinner, J. S. . . . . Augusta, Ga.
Smith, Chas. A. . . . . Ashland, Ga.
Smith, Chas. T. . . . . Concord, Ga.
Smith, S. P. . . . . Winder, Ga.
Smith, T. W. . . . . Warthen, Ga.
Sommerour, C. W. . . . . White Plains, Ga.
Stafford, W. C. . . . . Barnesville, Ga.
Starnes, Hugh N., Hort. Ga. Exp. Station . . . . . Experiment, Ga.
Stevens, W. W. . . . . Mayfield, Ga.
Stone, B. W. . . . . Thomasville, Ga.
Stubbs, C. T. . . . . Montrose, Ga.
Stubbs, John M. . . . . Dublin, Ga.
Stubbs, Mrs. John M. . . . . Dublin, Ga.
Sturgis, M. B. . . . . Washington, D. C.

Tappan, E. I. . . . . White Plains, Ga.
Tappan, R. . . . . White Plains, Ga.
Taylor, H. W. . . . . Marshallville, Ga.
Tribble, W. C. . . . . Lavonia, Ga.

Uhl, George . . . . . Augusta, Ga.

Wade, I. C. . . . . Cornelia, Ga.
Walker, Z. T. . . . . White Plains, Ga.
Warren, R. H. . . . . Albany, Ga.
Warthen, M. . . . . Warthen, Ga.
Weslowsky, M. . . . . Albany, Ga.
West, C. G. . . . . Fort Gaines, Ga.
West, John T. . . . . Thomson, Ga.
West, J. W. . . . . Fort Gaines, Ga.
Whaley, James T. . . . . Whaley, Ga.
Whaley, Thos. W. . . . . Mayfield, Ga.
Wheatley, J. W. . . . . Americus, Ga.
White, Herbert C. . . . . DeWitt, Ga.
White, H. K. . . . . Sparta, Ga.
Wight, J. B. . . . . Cairo, Ga.
Willett, N. L. . . . . Augusta, Ga.
Williams, A. D. . . . . Yatesville, Ga.
Williford, W. D. . . . . Harmony Grove, Ga.
Willingham, W. L. . . . . Harmony Grove, Ga.
Willis, J. B. . . . . Walden, Ga.
Willis, W. W. . . . . Ty-Ty, Ga.
Withoft, C. W. . . . . Fort Valley, Ga.
Wright, W. C. . . . . Fort Valley, Ga.

Zelner, S. H. . . . . Zelner, Ga.

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HONORARY MEMBERS.

Alwood, Prof. W. B., Va. Polytechnic Inst. . . . . Blacksburg, Va.
Bailey, Prof. L. H., Dir. Cornell Exp. Sta. . . . . Ithaca, N. Y.
*Bush, Isidor . . . . . Bushberg, Mo.
Crayton, Hon. B. F. . . . . Anderson, S. C.
Furnass, Hon. R. W. . . . . Brownsville, Neb.
*Gray, Prof. Asa . . . . . Cambridge, Mass.
Green, Mrs. C. C. . . . . Clayton, Ala.
Hale, J. H. . . . . South Glastonbury, Conn.
Hexamer, Dr. F. N., 52 Lafayette Place . . . . . New York, N. Y.
Joly, Chas., V. P. Natl. Hort. Soc. of France . . . . . Paris, France.
*Meehan, Thomas . . . . . Germantown, Philadelphia, Penn.
Munson, T. V. . . . . Denison, Tex.
Newman, Prof. J. S. . . . . Clemson College, S. C.
Quinn, P. T. . . . . Newark, N. J.
*Simms, Col. R. M. . . . . Columbia, S. C.
Stayman, Dr. J. . . . . Leavenworth, Kan.
*Thurber, Prof. George . . . . . New York, N. Y.
*Wilder, Hon. Marshall P. . . . . Boston, Mass.

*Deceased.

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Proceedings.

FIRST DAY—MORNING SESSION.

The Twenty-Seventh Annual Session of the Georgia State Horticultural Society was called to order in the Opera House in the city of Athens, Ga., on the morning of August 3, 1903, Vice-President G. M. Ryals of Savannah, occupying the chair in the absence of President Berckmans.

The session was opened with prayer by Rev. Dr. Morris of Athens.

On behalf of the Mayor of the City of Athens, Mr. T. W. Reed, of the Athens Banner, delivered a short address of welcome as follows:

Gentlemen:

My words shall be few this morning. This is a business body, and my address shall be of a business nature. I am here, representing the Mayor of the City, to extend to you a word of welcome on behalf of the Mayor and City Council and people of the City of Athens. I bid you welcome to the city—to all the hospitality for which it is noted. Our people are glad to have you with us and we are interested in your work, as we are interested in all educational and progressive work in this State. We hope your stay here will be pleasant and that you will carry from this city memories as sweet and fragrant as the lovely fruit which we enjoy through the industry, labor and study of horticulturists throughout our State. Again, Mr. President, allow me to state on behalf of the city that we bid you a most hearty welcome.

Prof. Sylvanus Morris, Dean of the University Law School, representing Chancellor Walter B. Hill, then delivered the following short address of welcome on behalf of the University:

Mr. President and Gentlemen of the Society:

Representing the Chancellor in his unavoidable absence it is my pleasure to extend to you a welcome on behalf of the University, the State's Institution of higher education. I hope that each and everyone of you will, during his stay here, make it his business—and I hope it will be his pleas-

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ure—to investigate for himself each Department of the University, and see what we are endeavoring to do for Georgia, to quicken the intelligence of the young of the State, and strengthen them physically and mentally, and thus make men, who will be able to control the business of this great Commonwealth. All that we ask is that you should know us, and we feel that you will be our friends.

I am also requested by the Chancellor to say that the Association is requested to hold the evening session in the University Chapel. It is more convenient, and perhaps pleasanter at this season of the year.

I am also requested to extend to each member of the Convention an invitation from the Denmark Dining Hall—which has been the work of Prof. Snelling of the University—to take a meal as the guest of the Dining Hall.

Now without delaying longer the business of the Association, I most cordially, in the name of the University, bid you welcome to our city.

On behalf of the Horticultural Society Col. I. C. Wade, of Cornelia, Ga., responded to these addresses of welcome as follows:

Gentlemen:

It is a source of gratification to us to have these words of welcome said to us on this occasion. We have come here to this center of our civilization in the State of Georgia, from which should emanate every line of progress. We are proud of the great work that is being done here for the good of our State, and we are proud of Chancellor Hill. One of our objects here should be to show the teachers the great work that is being done outside of the curricula taught here. The great work that is being done in agriculture should be of interest to everyone. I want to say now that our schools will never be satisfactory to me, nor to any farmer in the State, until agriculture is taught in every primary school in the State. I don't believe in any system of education not based on a solid foundation.

Col. Wade then told of the terrible shrinkage in the value of farm lands in New York State by reason of the fact that agriculture is not taught in the common schools, and the young men all go to the cities, leaving the crops to be made by the women and children. Col. Wade contrasted this with Wisconsin, where reverse conditions exist, and showed how the taxable value of farm lands had materially enhanced.

Concluding he said:—"We thank you for your kind reception. We expected it. Everybody expects a cordial welcome in Athens. We are glad to be with your people on this occasion."

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Chairman RYALS: "The next number on the program is a paper to be read on Georgia's Seed-Growing Industry. It will be presented by a gentleman who has made this matter a study, who has written upon it, and whose articles have been read all over the country. This gentleman is a writer along horticultural lines, and is the author of 'Nature in the Witness-Box.' I present Mr. N. L. Willett, of Augusta, Ga."

The Georgia Seed Growing Industry.

BY N. L. WILLETT.

Mr. Chairman and Gentlemen:

I present you some thoughts today to aid, perhaps, in an industry that may serve for you as a side line. There are many plants whose best habitat is somewhere in this State, with its three geological conditions. Georgia should supply these seed, therefore, to the world; and you might as well become a grower of same. Wherever a plant has its fullest development, that place should produce this seed for all other places.

There are a great variety of seeds whose best habitat is not confined to one locality but which are imported largely into Georgia. These seed should be grown at home.

Every farm in Georgia ought to be to some extent a seed growing farm. I contend that no man should grow hybrids unless he proposes to name, develop, advertise them, and so reap the benefit of a new and fixed variety. To grow scrub varieties on one's farm prohibits any planter from ever disposing of surplus stock as seed. To grow pure high grade types to their best development, and so create among your neighbors or others a demand for the seed of this type at seed prices, which are always higher, is a laudable ambition and a profitable one on the part of every man who plants.

I have done as much as any man, perhaps, in Georgia, probably far more, to exploit and foster a Georgia Seed Growing Industry. I have growing for me today in Georgia some sixteen or seventeen thousand pounds of Okra, costing about fifteen hundred dollars. I have growing some nine thousand pounds of Collard seed, also, at a cost of some seventeen hundred dollars. I have twelve thousand pounds of Turnip seed, costing about one thousand dollars. This is only a small portion of quite a long list. Every seed man in Georgia is importing yearly many car lots of seeds that might as well be grown in this State.

Among the lighter seeds let me mention, first:

COLLARDS. Something like thirty thousand pounds of collards are grown in Georgia each year. The whole United States seed trade comes practically to Georgia each year for its collard seed. The seed trade call collard seed "Georgia Collard Seed." We have a supremacy here over the whole United States. The South sows most of this seed; they are but little known and little sown in the far North. There are thousands of little garden patches in Georgia that really contain nothing else except collard

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plants. For seed growing, collards are planted from August to October. The plants are usually transplanted from a garden bed. The ground for this crop is prepared as if cotton were to be planted; two hundred pounds of guano is sown per acre in the drill, and two to four hundred pounds in the side furrows as they are cultivated. Cultivation is done with sweeps and just often enough to keep weeds down and the ground freshened up. Work ceases by February 1. Seed ripen by May 15. They are gathered on sheets twelve to fifteen feet long, and five to six feet wide. Two hands to a sheet, one at each end, should go between the alternating rows, spreading the sheet down between the stalks, and the stalks down over the sheet; and then rub out with their hands upon the sheet the ripened seeds. All the seed do not ripen at once. This process is gone through with at least three times. The seed are then spread on sheets in a cool place for a few weeks and dried; and are then cleaned by an ordinary grain fan and sacked and stored in a cool place. While in the milk, along in January, or February, the seed will not stand less than seventeen degrees of Fahr. Fifteen degrees thermometer in January will kill out a crop. Three to five hundred pounds of seed can be grown per acre. There are two kinds of collards: the tall, old fashioned "Blue Stem," and the new and shorter "White Cabbage Collard." This latter is more tender than the Blue Stem and three-fourths of them head up in winter.

Georgia, perhaps, grows twenty to thirty thousand pounds also of

Turnip Seed. As cabbages grown successively from Southern grown seed will degenerate into collards, so many kinds of turnips grown from Southern seed will degenerate in size in the roots, and, on the contrary, will increase in tops or greens. There are four kinds of turnips, however, that do excellently well grown from Southern seed. Indeed this is their best or only habitat. The Seven Top Turnip must be exclusively grown here in Georgia or about us. Its roots amount to but little, but it has a large branching head and makes early and most excellent greens or salads. Quite an improvement over Seven Top is the Southern Prize. It is known, also, as "Improved Seven Top," "Dixie Land," "Frost King" and "Hardy Winter." While having as much greens as Seven Top, it produces a fine, white, large and hardy tuber. If uneaten in fall the Southern Prize will again put out spreading tops in January, which make spring greens and will make a bitter pot liquor prized by negroes and some others. Another turnip from the Ruta-baga family, large, hardy, white, juicy, elongated in shaps, is known as "Breadstone." This is a most excellent Southern turnip, and it has greens or tops exceedingly tall and which do not look like the tops of other turnips, but resemble Kale. Its leaves are smooth and not rough. Another turnip that reproduces in Georgia is the "Cow Horn." This is a white turnip, much prized, elongated like a carrot, and oftentimes crooked like a cow horn. These are the four special turnips especially adapted to this Georgia Seed Growing Industry. Almost the same identical culture and process for gathering, and time for ripening, obtains for turnips as for collards. The outturn per acre, however, is considerably more than collards, and the price obtained for the seed is less, necessarily.

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These seed grow fairly well as high up as Virginia; but Georgia and South Carolina are largely obtaining now the trade in the turnip business. Outturn per acre 300 to 1,000 pounds, according to soil.

Turnips must be planted shallow and good moisture is necessary for germination. Weeds must be kept carefully down; should be drilled and fertilized well. The hoeing of this in cultivation is rather tedious. A good feature of turnips, as in mustard, is that they mature and are gathered in time to make a crop and then leave your soil in a better condition for grain or peas. Sowing time, from the latter part of August until the 10th of October. Where roots are desired the sooner they are planted the better.

Many growers use a threshing machine and fan mill. Others do not use a thresher but beat out the seeds upon large sheets, after they have been cut three or four days. An oscillating screen 3x8, worked by hand, separates chaff from seed.

Similar in cultivation and in gathering, to turnips, comes

MUSTARD. About three hundred pounds per acre is possibly the maximum of mustard. Georgia has practically the monopoly. There are three kinds grown. The ordinary kind, known as "Southern Giant Curled," Chinese Mustard, and lastly, Ostrich Plume Mustard. This latter is the finest mustard in the world. It came up sporadic in a market garden in Augusta. I secured about two ounces of the seed. I named it, and finally introduced it to the supply trade of the United States. It has been listed by the trade under various private names and many sell it under the head of novelties. It is much taller, more branching, more tender, than other mustards. Its leaves are crimped and look like long ostrich plumes. A plant that I had photographed weighed about four and a half pounds. It is really pretty enough for a centre table ornament. Ostrich Plume Mustard does not seed as well as other kinds and brings also a higher price. Let me add that the Augusta market gardener who owned this sporadic plant, outsold for three or four years all of his Augusta competitors, on account of the beauty of his mustard. It was only by dint of persuasion that I finally persuaded him to allow me to grow and introduce it to the United States. Mustard can be threshed on a modern threshing machine and cleaned on a fanning mill.

Mustard is quite an uncertain crop. Unpropitious weather has great influence on it. It is quite an inexpensive crop to grow, however. A fair yield is 250 pounds per acre.

OKRA. I believe that the great majority of the Okra seed of the United States is grown in Georgia. There are four leading varieties: Tall Green, Dwarf Green, Ladyfinger or White Velvet, and Perkins Mammoth Pod. Okra is planted and cultivated very much as cotton. It is threshed on a wheat separator with some extra attachments. The average yield is possibly 500 pounds per acre. Possibly something like sixty thousand pounds of okra seed supplies the United States seed trade, and nearly the whole of this, as I have said, comes from this State. In some parts of the country it is called "Gumbo."

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PEARL OR CATTAIL MILLET. For some reason the growing of Pearl Millet for the United States seed trade is very largely confined to this State. This is drilled very thinly; is threshed in the fall on a wheat separator. The yield is not large—possibly not over 500 pounds per acre. Wherever there are English sparrows the growing of Cattail Millet for the seed is not profitable. The West has begun to grow this to some extent; out there it is called "Pencillaria." Georgia sends out annually a very large amount of Cattail Millet. Sales are made, ranging from 500 to 2,000 pounds at a time. Millet is threshed on any modern threshing machine and cleaned by a fan mill.

COTTON. I believe that the best cotton seed of the whole South comes from Georgia. The United States Government's seed distribution annually for many years of cotton seed, has been made from Georgia. I have usually filled this contract. No man should grow scrub or hybrid cotton. I have induced in the past ten years, a large number of planters to grow only pure and well known types, and to sell the seed from the richer portions of their farms, not to the oil mills, but for seed purposes. A number of my friends have found this quite profitable, and are making a business of supplying cotton seed for seed purposes.

At the Richmond County Reformatory, of which I am chairman of finance, and which makes, with its 75 boys, from seventy-five to one hundred bales of cotton per year, we sell nearly the whole output of our cotton seed, at one-third price above oil mill price, for seed purposes. Our farm is sufficiently extensive to prevent our seed from mixing, and we plant Russell, King and Peterkin. Unless a man cares to hybridize cotton for himself, to give it a name, advertise it and exploit it, it is far better to select, as I say, some well known type or types, and make it to produce so well as to make his neighbors envious, and thus promote the selling of his seed to them another season. I made from Georgia a few years ago, the largest shipment of cotton seed for seed purposes probably ever made. This was to the Agricultural Department of Turkey, who are making experiments in cotton culture. Besides the three above varieties named—Hawkins, Truitt and Jones are leading kinds. Amongst the long staples, Doughty's is the very best.

OATS. Georgia has undoubtedly, for the South, the two best oats today known. One is the Appler, which has a ten per cent. heavier yield in the matter of seed or grain and stalks or forage, and is about a week earlier than our "Native Rust Proof Oat," and fifteen per cent. better in grain and six inches taller than Texas. It is indeed a higher type of this former oat. It has been largely exploited by the Experiment Station of Georgia, and Col. Redding told me two years ago, when other oats were selling at 50 cents a bushel, that he could have sold ten thousand bushels if he had the seed, at 75 cents. Oftentimes these seed weigh as much as 42 to 43 pounds to the bushel—so heavy and large are they. Our own Georgia Red Rust Proof Oat is a much heavier seed, larger and redder in color than is the Texas. I prefer it greatly to the Texas. In a given bushel of Texas Oats there is far more beard, which is waste, than in our native

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Rust Proof. There is no reason why Georgia should not largely exploit these two oats. There is no reason, too, why Georgia should have to go to Tennessee each year for her Burt Oats—the Burt Oat being the only genuine spring oat that is reliable. The sowing of Burt Oats is going to be more common each year, because the killing out of fall sown oats in Georgia is going to be a more common occurrence, seemingly, each year. We must remember that Texas Oats, in Texas, are only sown in the spring. The same is true of Tennessee Oats, Oklahoma, Kansas, Ohio. A spring sown oat, no matter where it is from, is not as hardy as our native Georgia fall sown oat. I attribute the annual winter killing of our oats, which is a growing evil, to the fact that each year we are sowing more largely spring grown oat seed. It is especially a dangerous proposition, for several reasons, to grow spring grown oats imported from Ohio, Kansas, Indian Territory, and Oklahoma. Georgia should grow her own seed oats, fall sown. She can afford to pay more for them than for the cheaper spring sown foreign oat.

The originator of the Georgia Red Rust Proof Oat was a man named Anderson, down in Wilkes county, Ga. He bought some seed from a Russian warship, planted them, and they made a tremendous sensation in those days in his county. Seed were sent to Augusta guaranteed as rust proof, and were sold as high as $5.00 a bushel.

BURR CLOVER. The introducer of Burr Clover into the South was Mr. D. B. Cade, who lives on the banks of the Savannah river, above Augusta. This is sown in September. No method of separating the seed from the hull or burr is known—some six or seven seed are in each burr. The germination of Burr Clover is uncertain the first year. When planted, seed from the same burr may germinate one by one in the ground consecutively for three or four years. Ten years ago you could not buy ten bushels of Burr Clover seed in Georgia. Now there are a number of men who are growing 100 bushels, and some as high as three or four hundred bushels, of seed. The process of gathering is rather rough, as no means are known for getting, without much trouble, foreign matter from the seed burrs. Let me add in passing, that sown with Bermuda Grass the two combined make a perennially green land for pasturage. Burr Clover once planted should be good for twenty years or more. Plant only three-fourths of an inch deep, with good smooth harrow, from the first of July to the middle of October. It matures about the 10th of June. When cut, a sufficiency of the seed must be allowed to fall to the ground for next season's growing. When mature, the seed are raked off the stubble with a horse rake. The loose burrs fall to the ground and are brushed into piles with brooms. The sand can be sifted out through an oscillating sieve. Stones and other trash are picked out by hand. Fifty bushels, weighing ten pounds to the bushel, is a fair yield per acre.

CHUFAS. Probably more Chufas are sold to the United States trade from Georgia, than from any other State. Some of the growers declare that two hundred to four hundred bushels per acre can be grown. No insect attacks them. Once sprouted and growing, they withstand almost any

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amount of dry weather. The plants stool heavily. If two chufas are grown together the result will be one or two quarts of chufas. They should be planted on high, rich, dry, loam or clay. Soak for two or three weeks before planting. Plant from April to June, one peck to the acre. They should be planted two and one half feet apart. Land should be broken up and not bedded. Chufas planted in a bed or hill may dry out and die. Cover with a bull tongue; any fertilizer except acid can be used. Can also be planted middle of May, in the middle of corn rows, like cow peas, and cover with a plow. The gathering process in the fall is by hand and tedious. If washed, they must be thoroughly dried. They can not be kept in sacks. If sacked, they sweat and ferment. They must be spread in order to be kept, upon the floor, an inch or so deep and stirred frequently. In freezing weather, sacks must be put over them.

ASPARAGUS. Few plant industries today exceed, in profit, that of asparagus growing. I know this season of as much as $400.00 per acre being made through its shipment to Northern markets. The best of all asparagus is the Giant Argenteuil. Asparagus seed are having greater sale each year. Asparagus will take any amount of fertilization one cares to give it—the more the better. Broadcast the land with stable manure, the last of February or March 1st. Turn under with a two-horse plow, and if it is a clay sub-soil, follow with a two horse sub-soil plow. Break the land eighteen inches deep. Lay off rows six feet apart and throw up a high bed. Drop roots about thirty inches apart; roots should be covered about two inches; can be cultivated with sweep and hoe. In the fall the ripe stalks are cut and beaten or threshed out and fanned. The asparagus seed growing industry is entirely a by-product, by the growers of asparagus; for there is a full crop of asparagus stalks that make their appearance on all asparagus farms, after the shipping season is over with.

ASPARAGUS ROOTS. There is also a large industry in this State in the selling of asparagus crowns or roots, in the early fall, or in February or March. These can be taken from the asparagus beds from a surplus of roots, or grown directly from the seed. Seed men, as a rule, buy asparagus seed for ultimate root selling; but few growers of asparagus, for market, buy other than the roots. They save one or two years by root buying. These roots are sold by the thousand, and are shipped in barrels or sacks. They will keep two or three weeks provided water is sprinkled upon them.

MELONS. The shipping of melons North began in 1867 at Augusta. The sandy lands of Southern Georgia, on a parallel with Augusta, make the best melons in the world. Melon vines grown farther North often produce from six to eight melons to the vine, but they are all small. No Southern grower of melons saves seeds from more than two melons per vine. It takes about eight melons to make a pound. Colorado and Oklahoma melon seed will prove failures in Georgia. Florida sells large amounts of melon seed; but this peninsular is between two salt oceans, with salt winds in the air over all portions of it. Salt air means death to the quality of melons. Sandy soil, with its strata of clay underneath, is

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best. Plant six seeds to a hill, and hills eight by twelve. Work only the wide way. A good fertilizer is two hundred pounds cotton seed meal, one hundred pounds acid phosphate, one hundred pounds kainit, per acre. About four hundred good melons per acre, or one-third of a car, may be obtained. In saving seed, every melon under twenty pounds should be rejected. One or two careful hands go ahead in the field and with large butcher knifes cut open the melons from which seed are to be taken. They turn the cut sides up, if the melon shows up all right, and turn them down upon the ground, if they wish to reject them. Other hands follow with buckets and scrape the seeds, juice and pulp, into them. These buckets are emptied into barrels conveniently placed in the field. To separate the seeds, use a screen two by three feet, No. 12 wire, with mesh 1-4 inch. The barrel contents are poured into the screens and rubbed until all goes through except the seeds. Seeds are then dried and sacked. Some years ago I advised a grower near Augusta to advertise under his name genuine Rattlesnake in the Northern press. His farm adjoined the farm upon which this melon originated. He accepted my advice and today he sells annually about three thousand pounds, in a retail way, all over the United States, at double the usual price.

Second Crop Irish Potatoes. Hundreds of car loads annually of Maine seed Irish potatoes, spring grown, are brought into Georgia for growing purposes. The Western potato is worthless here except for eating. It can not be planted, for when planted, it goes to vines and makes no tubers. These Maine potatoes are brought more than fifteen hundred miles; whereas our second crop potatoes—planted July or August and gathered about November 1st—are a better seed potato than the best Maine. This second crop is hardier than Maine, keeps better, is more prolific, and as early. The three leading varieties are Crown Jewel (the earliest of all potatoes and used almost exclusively by Southern truckers), the Red Triumph, and the Red Rose.

Not one single barrel of Maine potatoes should be brought for seed purposes into Georgia. The proof of the hardiness of our fall grown potato. its superiority to the spring grown Maine potato in this regard, is seen in the fact that when these two potatoes are put into cold storage the Maine potatoes grow soft, while those of the the second crop are preserved in excellent condition. I have had 100 sacks of second crop in cold storage for the past three months at a temperature of 34, and they are in excellent condition. Let me add that Georgia does not half appreciate the value of a fall crop of Irish potatoes, July or August sown. Many fail to get stands, because the ordinary potato when cut, ferments and rots in the hot ground before it sprouts. Many therefore eschew this August planting. For this August planting, the best of all potatoes is this Georgia second crop potato, gathered in fall, put in cold storage the succeeding April at 34 degrees F. and sown in July or August. The florist when he wishes to force a flower, takes his bulb out of cold storage and plants it. Cold storage potatoes when planted, sprout far more quickly than other potatoes. This early sprouting is the salvation of the crop. If cold storage potatoes are

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not used, it is best to bank with straw and force potatoes into sprouting, before they are planted.

BEARDLESS BARLEY. This type is only three or four years old. All of it has come from Ohio. It is one of the most valuable introductions in the farmer's world in a half score of years. It is absolutely beardless, and therefore, wholly free from danger for feeding purposes, and is infinitely better than the bearded. It is a rapid grower. It will head in fall, but it will not stand the winter well. It is the great spring quick growing green crop. Will be ripe for seed cutting in less than ninety days; makes a large amount of forage and is quite tall. Its outturn in seed barley is 35 to 40 bushels or more. I have had a large amount of this grown this spring here in Georgia. There is no finer habitat for it in the world. This barley should be largely exploited for grazing, hay, and for seed barley. Georgia certainly ought not to import another bushel from Ohio.

RYE. The best type of rye in the South, I believe, comes from Georgia. There are two types of this planted. One sown in Tennessee, North Carolina, Virginia, and farther North—white rye that is sown in spring. This is cheap and is sold largely by grocerymen for seed purposes, in place of the genuine Georgia. White rye will not stand our winter climate; trails on the ground, and does not grow tall. The tall Georgia rye is fall sown; it is hardy; it grows tall. Every farmer in Georgia does, or should, grow rye, and nearly every farmer buys the seed he sows. It is said by some that it improves land to plant rye upon it, even though it may not produce heavily. I know a goodly number of men who are putting from $100.00 to $300.00 of greenbacks yearly in their pockets from their rye crops, and are getting back, they think, in added land improvement, the total cost of production.

WHITE MULTIPLYING ONIONS AND YELLOW MULTIPLYING SHALLOTS. These are two large Georgia seed growing industries—the same culture is used for both, and when I speak of the one, why I speak of both. These are planted on well ploughed, well harrowed land, in September; fertilized a thousand pounds commercial guano per acre. Lay off rows two feet apart. Every ten inches in row plant one bulb. Cultivate with a cultivator. No cold can kill them in this latitude. They grow all winter. By January each single set will multply into a bunch containing fifteen to thirty onions. Ready for early marketing in January; the whole top and bottom being pulled up together and the whole bunch sold as green onions. The bunch usually retails for 10 cents. Those not pulled in January continue to grow, reaching maturity in May. By that time the bulbs or bottoms will touch all along and continuously in the row. The product of one primary bulb can not be put into a two quart measure.

Ten onions from one bulb is a small yield. The White Multiplier keeps all through summer, and through the following fall and winter. In size this onion is not so large as other onions, but its flavor is milder and more delicate. The yield per acre varies, of course, with the land, and it can be easily seen that the output of a given acre is large. When sold in August, thirty-six pounds and sometimes forty constitute a bushel. They

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are also sold for January planting, though this is not so good a season as September. Thirty-two pounds, in January, is a standard bushel.

MEXICAN JUNE CORN. This, too, is a growing industry. It is the whitest of all corns and the latest to be planted. Do not plant before June 20. No other corn grows so tall. Every stalk is twelve to fifteen feet high, and makes a prodigious amount, too, of fodder—the blades being both long and wide. It does not make any ears until September. It gives roasting ears throughout the fall. It does not harden like other corns; must not be pulled from the stalk for seed purposes, or for the corn house, until late in December. It makes several ears to the stalk. The demand for this corn is increasing yearly. I sold this year to one New Orleans house 350 bushels.

SPANISH PEANUTS. This also is one of the seed growing industries of Georgia. Sixty to one hundred bushels per acre, at least, should be made. It is a shame that Spanish peanuts are not on every farm in Georgia. Two crops of these can be made per year. First crop should be planted in March and the second crop after oats. Sandy lime land is the best. All the peas hang to the roots as the whole plant is pulled up. These can be put in a storage barn, and the whole product fed to hogs; or the peas can be picked for market, and the vine, which is ravenously eaten, fed to the cattle. These can be planted, if necessary, in the corn rows.

UPLAND RICE. There is always a good demand for this crop for seed purposes. It can be planted on high land, like oats; damp places of the farm are preferable. There is no better rice in the world than our native Carolina or Pearl Rice. The Honduras or Japanese types, while advertised and exploited, are not as good as our native Carolina. I look for rice straw, (on account of its great strength, aside from seed rice) to be a commercial factor in the future.

JOHNSON GRASS. There is no reason why this seed should have to be brought yearly from Texas. That state supplies the United States seed trade and the demand, let me say, is growing faster than any other grass seeed that I know of. The supply for the past two years has been just about one-half the demand. If you are skeptical as to the value of Johnson grass for hay purposes, come down to Augusta and look at our dozen or so large Johnson grass farms, and you will be converted.

VETCHES. There is no reason why France should supply the Hairy Vetch (*Vicia villosa*), nor the English Vetch (*Vicia sativa*), to the United States. Vetches grow as well in Georgia as any other place in the world. If you are an unbeliever come to Augusta and see our big vetch farms.

SORGHUMS. One hundred bushels of sorghum for seed purposes this past year were grown, where one bushel was grown a year ago. The Amber and Orange are the two leading varieties—the Amber being earlier and smaller in size. There is no reason why Kansas or Tennessee should supply the seed trade to the United States. The crop of Amber cane this year was simply unprecedented. Kansas over-produced herself and cane seed has been selling there freely at 25 cents a bushel.

COWPEAS. Augusta exports each season alone, about 100 cars of cow-

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peas. The crop this past year was heavy and the price low, as compared with the year before. This is largely a by-product on the farm; but even by-products mean dollars to the farm. My own leanings are toward the Unknown Pea, called "Wonderful." New Orleans largely buys the "Mixed Pea." All Northern seed houses want "Whipporwills." The United States government is exploiting the small hard "Iron Peas" as being wilt proof. This pea can be sown with oats in the fall; will lie in the ground all winter, and will not come up until after oats are off—thus saving an extra cultivation.

Lima Beans; Large Pole, and Small Pole or Sieva; Bush Lima Beans; Southern Prolific Pole Beans; Kentucky Wonder Pole Beans. The Limas are almost wholly grown today for the United States trade in lower California. They bring about four cents a pound—sometimes three and three-fourths. Parties who have experimented in Georgia with these for seed purposes have been pleased with the result. There is a good market at all times for the seed. All of the grocers' limas, both large and small, also come principally from California. Grocers' limas are sold in enormous amounts. These beans are steamed in order to kill the seed germ. Southern Prolific Beans are a genuine Southern Bean. They can be grown even in corn fields and on corn stalks. It is a prolific bearer and there is always a good demand for the seed. More prolific still in output is the Kentucky Wonder Bean which is by far our best pole bean. It is of the same family and looks very much like the Southern Prolific; but as I have said, it is much better. So much depends upon the land that I shall make no estimate of yield per acre for beans. One can arrive approximately at an acre's output by testing one vine and by finding what proportionate part of a pint or a quart it makes and then multiply these by the number of plants that can be grown upon one acre.

The Peach Seed Industry. The saving of peach seed is a by-product business. No one undertakes to grow peaches in order to get the seeds—the price of which is oftentimes something like fifty cents a bushel for the dry seed. This is not sufficient, as I say, to grow peaches in order to get the seed. Peach seed are used by nurserymen who grow seedling trees, upon which they graft or bud. Wherever in the rural districts people cut up and dry peaches, (and this is largely done in most of the States South), they can save this by-product of peach seed.

All nurserymen prefer that their seed should be from seedling trees. Seedling tree peach seed are better because they are sound and have no crack in them to cause the kernel to mould. They germinate better, and give a better stand. Seedling seed are worth twice as much as the seed from grafted trees. Seedling seed are only about one-half as large as seed from budded trees. There are often six thousand seeds in a bushel of standard peach seed. From budded peaches you will only get from two thousand to four thousand in one bushel. When planted, too, you do not get so good a stand from the budded as you do from the natural.

A small industry in a small way might be built up in the whole country in the saving of peach seed. In the saving of these seed it is well to re-

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member that if they are piled up in a heap, they will heat and damage. The way to save them is to spread out thinly in the shade of a tree, and let them dry in this way. Free-stone steed are the cleanest and the brightest, and are preferred. Fifty pounds make a bushel.

Seed from canneries are not so highly prized because most often these are from budded trees.

A FANNING MILL. Any man who grows seeds for seed purposes, and especially for seed commercial purposes, should have a fan mill. I have used for a long while the Chatham fan mill. It is a grain separator and a grader. It cleans, separates and grades grain and seeds of all descriptions. In offering a man a certain seed you certainly, in the first place, should not give him seed mixed with an extraneous article, or other seed. You should at the same time give him a seed uniform in size and quality. Fanning mills will cleanse and grade the finest mustard or turnip seeds up to wheat, oats and corn. Seeds that have been fanned and graded, bring better prices and produce better crops. A fan mill—and these can be bought on three or four years' time, thus making a small outlay each year—is a necessary part of the outfit of every commercial seed grower. There are many who contend that even seeds for feeding purposes, which would include all the seed grown on the farm, should be run through a fan mill. Fan mills have bagging attachments and usually have a capacity of about 50 bushels per hour. The usual price for these is about $44.00, on time, if wanted. An example of its uses is shown in the following: Last season I had sent me a lot of rye mixed with oats and also with barley heads. These were separated by the mill—the rye with all faulty seeds eliminated, going into one bag—the graded oats going into another, and the barley heads into another.

Let me in conclusion say that I have noticed, especially in the past five years, great and growing interest in pure types of seeds. There has been a great desire on the part of land owners to make purer and better crops of given types, and to thus be able to dispose of at least portions of these crops for seed purposes—rather than feed purposes. I commend this whole study to you horticulturists as a side line to your profession. Especially do I commend it to you because you, more than the ordinary farmer, have been taught the value that lies in the best grades of things.

Chairman RYALS: "Gentlemen, you have heard the paper of Mr. Willett. Are there any questions you wish to ask, or remarks you wish to make upon it?"

Mr. WILLETT: "Yes, Mr. Chairman, I shall be glad to answer any questions that anyone may wish to ask."

Prof. H. N. STARNES: "I have enjoyed this paper extremely. I want to say, however, that there are thousands of farmers throughout this State, who would doubtless be glad to make

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seed-raising a side line, but the trouble is how are they going to dispose of their product? How can they get in touch with the great seedsmen of the North? How are they going to sell what they raise? I knew of a man once, who heard that okra seed would be very much in demand, and raised a large quantity for sale. He could not sell them to anybody. They said, in the first place, that he did not have enough, that he ought to have several hundred bushels. He was finally offered 25 cents a bushel, and he had to take it, while it cost him not less than $1.50 a bushel to raise them. Now is there any way to get an outlet for the product that would be sufficiently attractive to induce our farmers to adopt seed-growing as a part of their business?"

Mr. WILLETT: "The selling of a thing is just as important as the growing of it. If a man is not a good seller, he had just as well not grow anything. It's a separate line, entirely. I admit that to take John Smith, absolutely unknown to the seed trade, and have him try to sell 100 to 200 bushels of okra seed would be a difficult job. I have only two growers of okra seed. If I got it from ten men, I would not know that my grade of okra seed was homogeneous. These two men have made a specialty of this business for several years. My lecture was largely with reference to the commoner things. Now I cannot tell you just how you could succeed in selling any more than I could tell a hardware merchant how to sell his hardware, or a druggist how to sell his drugs. I have had men come to me, however, with the same complaint, that they can't sell the seed after they have raised them. The farmer ought to have sold his seed before he grows it, unless he has got a good neighborhood about him, which will see that he has grown such fine crops as to make them envious, and they will locally buy his seed. Now it's discouraging, as Mr. Starnes says, but I can only say that he must get an outlet for his seed just as he would for anything on his farm or in his store."

Prof. STARNES: "That's just the trouble with the farmer. He has got his cotton practically sold when he plants it. What encouragement is there for him to engage in seed-growing, when it is a mere accident if he sells it at a profit? What

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method is to be pursued to enable him to sell his 'side line' output?"

Mr. WILLETT: "Don't you believe that seven-eighths of the farmers are growing hybrids in cotton and corn, for instance? Does one man in seven know what kind of cotton or corn he has got on his place? Now my idea is that among those commoner types he can raise such high-grade crops as to make his neighbors envious, and get up a local market for his seed."

Maj. RYALS: "I noticed you emphasized the Spanish ground-pea. Why not mention the small Georgia pea?"

Mr. WILLETT: "That's true, and I am sorry I did not."

Maj. RYALS: "The Spanish ground-pea will start to growing again. Won't remain in the land."

Mr. WILLETT: "No, the Spanish peanut will stay in the ground. You can feed your hogs on it all fall, and my experience is that it won't sprout at all."

Maj. RYALS: "My experience has been that the other is preferable because they will stay in the ground until they are eaten up, but the Spanish ground-pea will commence to grow again."

Mr. WILLETT: "I pull my Spanish peanuts very early in the season."

Maj. RYALS: "That's what you have to do."

Mr. J. M. JOHNSON: "Is there not an excellent opportunity for an individual to build up a local trade in some of our staple products? Is there not a great oportunity for a man in a rich county in growing seed corn for his neighbors? Would it not be in excess of what an average farm would produce, and would he not sell it at an advanced price?"

Mr. WILLETT: "That is true. That is a line of discussion that I did not touch on at all. It's a most interesting work, and, if a man has an opportunity to propagate any hybrid, and he raises it, and names it, and puts it on the market as his own, he can make some good money out of it. The exploitation is as important as the origination of the thing, but it's a beautiful line of work, Mr. Johnson."

Chairman RYALS: "I want to announce that this afternoon there will be an exhibit of fruits in the gallery vestibule.

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As Mr. Deckner, who was to have read a paper at this session, has not reached here yet, a motion to adjourn would be in order."

On motion the Society adjourned until 3 o'clock in the afternoon.

AFTERNOON SESSION.

President P. J. Berckmans having arrived, the afternoon session was called to order promptly at 3 o'clock in the Opera House with President Berckmans in the chair.

President BERCKMANS: "I owe you an apology for being tardy. Yesterday I was unavoidably delayed at Savannah. I am, however, happy to be with you, gentlemen, and to greet you once more. We have with us this afternoon one who served you faithfully as the first Secretary of this Society. I refer to Col. J. S. Newman, of Clemson College, S. C., and I would be glad if Col. Newman would have a seat upon the stage."

Maj. RYALS: "Mr. President, I move that Col. J. S. Newman, of Clemson College, S. C., be elected an honorary member of this Society."

This motion was carried, and Col. Newman took a seat upon the stage.

President P. J. Berckmans then delivered his annual Address as follows:

President's Address.

Ladies and Gentlemen and Members of the Georgia State Horticultural Society:

One of the main considerations in selecting Athens for the annual meeting of various organizations whose ethics are all upon the broad plane for improving our rural industries, as well as fostering our educational progress, was the opportunity to meet those who were in attendance at the University's Summer Schools, that whatever emanated from their deliberations could aid prospective educators in their pursuits.

The need for Horticultural and Agricultural instruction in our common schools has long been felt, but notwithstanding our efforts for many years past to have the rudimentary principles of these pursuits included in

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the curriculum of our rural schools, no practical results have been accomplished.

The State is to be congratulated at the evident desire of the people's representatives to at last bring this matter before the Legislature and the passage of Messrs. Hardeman and Holder's bill, which provides for teaching the elementary principles of Agriculture and Civic Government in the common schools, and that one hundred and two votes were cast in favor of the measure with but five against it, prove that the necessities of educational progress are better understood than in the past.

Now that this measure has become a legal enactment, it is to be hoped that it will be made a compulsory feature in our common school system and not remain inoperative as was the fate, in the past, of many praiseworthy enactments. This matter should receive the active and hearty cooperation of every instructor who is present.

The mission of the Georgia State Horticultural Society is educational, especially in kindred sciences which make possible the success of fruit, plant, vegetable and field crops. In the

DIFFUSION OF HORTICULTURAL KNOWLEDGE

we must be mutually pledged. It therefore behooves every one of us who had the opportunity for observing new or improved methods of cultivation, fertilization, remedial treatment of plant diseases or destruction of noxious insects, to lay before others whatever knowledge he has accumulated, that they may reap the benefit therefrom. It is not my desire, (nor do I pretend) to act as censor upon whatever opinions may be expressed during these sessions which may not coincide with established facts, but I hold it is imperative that you must be the arbiter of what shall be published in the Society's proceedings, and whatever emanates from your discussions must be eminently reliable and stand the test of practical application.

FAILURES FROM FAULTY CULTIVATION.

During a long life of observation in various countries and localities, I have often noticed the crude attempts of children, and older persons, in the cultivation of plants and flowers and the concurrent failures resulting from the lack of knowledge of proper methods; this frequently brings discouragement. The love of flowers is inherent in woman's nature; of this we have illustrations wherever woman is found; it is also inbred in children and should be fostered in the home and in the school. This love for flowers is almost universal; the wealthy can gratify their wishes in the construction of elaborate gardens and greenhouses, but even among the great city's crowded tenements an empty tomato can is made to do duty as a flower pot for a geranium or some cheap plant, and a window sill is often the only available place for the gratification of the poor but earnest flower lover. Some of the popular family magazines usually devote space for brief cultural directions, but while these are often practical for some localities, mainly for Northern sections, these suggestions are not always appli-

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cable to our Southern requirements and if closely followed failures frequently result. Differences in climate, locality, soil and surroundings must be noticed and this can only be understood by some practical experience or from a competent teacher.

Rural life is bereft of its most pleasant features where the taste for flowers and beautifying the home is absent, and where the love of the beautiful in nature is not innate, then our surroundings must remain unattractive and many of our intellectual or physical comforts derived from an abundance of fruits, flowers and vegetables are withheld.

In this connection I trust that you will pardon me if I again refer to a subject which will greatly facilitate the cultivation of plants and avoid the drawbacks consequent upon a lack of knowledge. This is the establishing of

SCHOOL GARDENS.

wherever space will permit of this desirable adjunct to every common school and to give them such financial support that good results may be expected. A small money appropriation commensurate with the size of the available space, number of pupils and local conditions would accomplish what is aimed at, namely, to give the scholars practical instructions in the life pursuit which many will undoubtedly undertake. Here the elementary principles of plant life, as taught in the class room, can be practically illustrated in the garden, as a problem of arithmetic is best explained by the aid of the blackboard. The success of a school garden depends in the main upon the teacher who is to instruct the pupil—a love of plants and of flowers must animate whoever attempts to direct the garden work. Unless this is the case the garden will be left to take care of itself and whatever enthusiasm was shown in the beginning will soon diminish and the undertaking should in this instance not be attempted.

In looking over what has been accomplished in many Eastern States, there is an opportunity here to do a great work in cultivating horticultural taste in children upon which the more important and substantial requirements of their future avocations can build a sound foundation.

EXPERIMENT STATIONS

are established as the means for facilitating the pursuits of farmers, fruit and vegetable growers and by the demonstration of scientific discoveries to enable them to increase their products and avoid failures. The school garden should, therefore, be the Experiment Station of the prospective farmer or horticulturist. Advanced educators have long since recognized garden schools as an adjunct where the most valuable object lessons tend to produce a taste for work and out-door study; they realize that children's tastes, for or against horticulture, will be defined there and shape their consequent happiness and success in its pursuit.

FORESTRY.

Unless a vital question is continually agitated it must eventually become ignored. While we are taking active measures for protecting our orchard

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and field crops, nothing is done for the preservation of our forests or towards adopting a systematic course for arresting and replenishing the enormous areas of deforestation which is everywhere so recklessly carried on. As horticulturists we are all interested in co-operating for the enacting of legal measures, not interfering with individual rights, that will preserve what remnants are left of the former magnificent forests—a judicious system of planting all waste lands should be inaugurated to offset the gradual depletion of timber resources. Periods of drought are increasing in intensity, and our climatology is undoubtedly influenced by the denudation of large areas of land, our hillsides are gradually becoming more and more eroded and unfit for cultivation. There is so much in common between men and trees that we can understand why the ancient people who lived closer to them than we do now, often supposed that their trunks were the abode of departed spirits and held them sacred. Were they not wiser than our present generation?

BUREAU OF ENTOMOLOGY.

It would be idle to speculate as to the fate of our present fruit industry had not forceful measures been adopted four years ago towards checking the rapid invasion of scale insects; there could be but one deduction—annihilation. The continued pressure brought upon our State Legislature finally resulted in securing a small appropriation which permitted the establishing of a Bureau of Entomology and the appointing of a board to carry out the provisions of the law. Among the most instructive and valuable papers which have appeared in the Society's reports of the past four years are those of Prof. W. M. Scott, Chief Entomologist, and his former assistant, Mr. W. F. Fiske. Wherever the instructions and recommendations of these officers have been followed, the fruit growing interests have been greatly protected from insect depredations and fungous diseases. It has been the constant solicitude of the State Board of Entomology to adopt such rules and protective measures as have been found most expedient, both from the result of the field work of the entomologists and the suggestions of fruit growers, which have always received the utmost consideration, and I am satisfied, as one of the members of the Board, that its work has been freer from friction and criticism than is usually the case in other States. No harsh or arbitrary rules have been adopted in the proper and efficient administration of its duties; always considering the interests of every fruit, vegetable, or commercial grower in checking or preventing the spread of injurious insects or plant diseases. But there have occurred a few instances when the law was wilfully violated and in order to abate a menace to adjoining orchards our officers were compelled to enforce the requirements of the law. In these rare instances their action was upheld by our highest State legal authority.

I believe that I voice the sentiment of every fruit grower and commercial horticulturist in Georgia who had intercourse with Profs. Scott and Fiske, either in a business or personal capacity, in stating that they have in every instance received all the benefit which these officers could give, as

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well as a friendly and courteous treatment. We regret that our State is soon to be deprived of the eminently valuable services of Prof. Scott as State Entomologist, as we have also to deplore the resignation of his assistant, Mr. Fiske.

Where scientific ability is united with its efficient application, there is found a combination of qualifications which make such men sought after by other States or organizations, who will hold out such inducements as will secure their services. The small legislative appropriation allowed to the Board for conducting its affairs is inadequate to pay a salary that will permanently retain a scientist of a high order—merit and ability have their price. The offer of a larger salary and the prospect of subsequent promotion have induced both Profs. Scott and Fiske to accept more remunerative positions with the United States Department of Agriculture. "What is our loss is the Department's gain," as I was told by the Chief of the Division that has secured the services of Messrs. Scott and Fiske. And when Prof. Scott severs his official connection as the Secretary of the State Horticultural Society and the Bureau of Entomology, he will carry with him the assurance from all fruit growers that his work in their behalf is and always will be appreciated.

From the great difficulty under which the Board of Entomology has labored in the past in securing competent officers, I must warn you that unless our State Legislature realizes the necessity of protecting our great productive horticultural and agricultural industries, by securing the permanent services of competent entomologists, and pays them such a salary as will keep them with us, these great industries must eventually suffer and perhaps disappear. Let every member of this Society, as well as those of other friendly allied organizations, use their individual efforts towards securing an additional money appropriation for the Bureau of Entomology and enable it to increase its work of usefulness, in which it is now seriously hampered. The rapid increase in commercial orchards and nurseries requires the services of several additional inspectors, which are not now available because of the insufficiency of the funds at command. The strictest economy in the management of the affairs of the Bureau has been followed, there is not even sufficient room allotted to the officers, no room for the display of the collection of insects which gives the most desirable object lesson to visiting fruit growers and farmers and not money enough for the purchase of scientific instruments necessary for office work and investigation.

BIRD PROTECTION.

In Press Bulletin No. 40, issued last June by the Georgia State Experiment Station, is set forth the full text of the proposed law for the protection of birds, their nests and eggs. This law was formulated by the American Ornithologists Union and has already been adopted by twenty-five States, but so far Georgia has taken no action, although this Society has for many years past urged the enacting of such measures as will protect the farmers' and fruit growers' best allies.

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In the absence of such a law,* every progressive husbandman should constitute himself as the ruler upon his own land and forbid the killing of all insectivorous birds. If county clubs would enforce such rules a remedy would soon be found and in a few years our native birds would once more become as abundant as in the past and our crops be greatly freed from loss from noxious insects.

If we look at the great changes effected of late years in many of our communities it seems strange that so much could have been accomplished in so short a time; the past of our Society has been pleasant and beneficial—its future must continue to be one of activity, investigation and practical application of discoveries concurrent with success.

Some men have left discoveries behind them which have long survived and contributed to others the benefits which we now derive from them.

Let the mission of each of us tend to increase these useful works that we may survive the oblivion which is the common fate of those whose life-work was aimless, and that in perpetuating the objects and ethics of our organization we may have the satisfaction of having contributed our mite to the industrial advancement and educational progress of Georgia.

COMMITTEES.

President Berckmans then named the following committees:

On Fruits and Vegetables on Exhibition: .G. H. Miller, Chairman, R. C. Berckmans, James Cureton, Chas. Deckner, C. T. Smith, H. C. White.

On Resolutions: H. N. Starnes, Chairman, E. B. Heard, and I. C. Wade.

On Audit of Treasurer's Statement: D. M. Hughes, Chairman, C. J. Hood, and G. T. Jones.

President Berckmans explained the duties of these committees, and they were instructed to report not later than the afternoon session of the 4th, preparing their reports in shape to be read and spread upon the minutes of the meeting.

Col. I. C. WADE: "Another committee I would like to see appointed, and I think you will agree with me. I move that a committee be appointed, of which our President be Chairman, associating four others with him, to take under consideration the matter of making an effort to retain Prof. Scott with us as State Entomologist, and to see if some way can

* Calvin's Audubon Bill passed House July 27.

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not be devised to prevent his leaving the State, which would be such a loss to the State as to be well nigh irreparable."

This motion was carried, and the Chair stated that he would appoint the committee as soon as he could make a selection advisedly.

Mr. Chas. Deckner of Atlanta, then delivered his address on "Irrigation in Truck and Small Fruit-Growing," which was postponed at the morning session on account of Mr. Deckner's absence.

Irrigation in Small Fruit Growing.

BY CHARLES DECKNER.

Mr. President and Members of the Georgia Horticultural Society:

I have but a few suggestions on irrigation for small fruit to bring before this Society. When we speak of small fruit in the South it is generally understood that it means strawberries, raspberries, and blackberries. In the North gooseberries, currants, and sometimes grapes are included. Irrigation is the artificial application of water to growing plants where moisture is insufficient. This may be done in various ways, but there are two principal methods generally implied in irrigation, by pump or the elevation of water by power, and the other by conducting water from its source by gravity, horizontally, or nearly so, to the place where it is to be applied. The latter method is the cheaper, and thousands of acres in Georgia could be inexpensively irrigated by this method. In order to understand more clearly the importance of irrigation for small fruits, we must bear in mind that the latter contains in the neighborhood of ninety per cent. of water, and if we have ten berries you must realize that nine are water while one is solid, and this ninety per cent. water must be supplied if not already furnished by the clouds. It is true that berries will ripen with much less water than ninety per cent., but here comes the point where we are producing inferior fruit. The quality of a berry is valued by the quantity of sugar it contains. Nature, when the life of a plant is in danger, hastens the maturity of its fruit, and such fruit we call premature, and in this instance it does not allow sufficient time to turn starch into sugar, and as starch is insoluble and consequently tasteless, we say the berries are tasteless.

We see here the importance of sufficient moisture during the ripening stages of the fruit. The question has been asked: "Can this moisture be supplied by planting the berries on bottom land? We say, "Yes," both raspberries and blackberries will do well on good under-drained bottom land. The strawberry will seldom succeed on bottom land; due first, to late frosts, which invariably are heavier on bottom land than upland; then also there is danger of protracted wet spells, when the fruit is generally lost.

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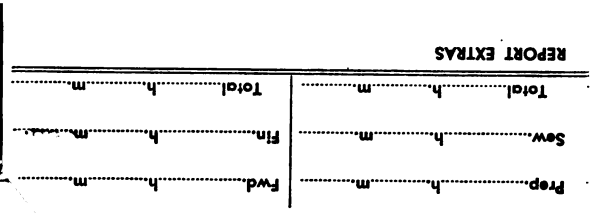

Quite different is the
the fruiting of small fru
gation, it is equally if not
we are using the pump to elevate water for irrigation. The water is taken from a small stream of about thirty-five or forty gallons capacity per minute. This is collected in a pond dammed with a rock and cement dam, and large enough to hold the inflow of twenty-four to thirty-six hours. Our pump has a capacity of sixty gallons per minute, elevating the water seventy-five feet high; the power employed is that of a gasoline engine of between three and four horse power. With this outfit we pump between thirty-six and forty thousand gallons of water per day. The oil consumed is five gallons per ten hours, and as gasoline engines run automatically, except for lubricating, this includes all the expense of running. When the land is thoroughly dry, it will take one and one-half days to so saturate one acre that walking over will mire. We have for the last six years kept twenty acres under perfect irrigation. To irrigate by either power or gravity the constituency of the soil will first have to be considered; where the soil is light, loose, and sandy, the water must be applied over the entire surface of the land. In this instance the water is thrown on the land by hose and sprinklers, and an elevated tank is necessary, but where the soil is heavy and inclined to bake, the water should be applied in narrow furrows between the rows of the crop. There should be no overflow to bake the surface, but the water should run gently down the row at an incline, so as not to cause washing. In setting fields to small fruit to be irrigated we should bear in mind that the rows should be laid off at such an incline. On our farm when we find irrigation necessary we run a scooter plow between the rows of strawberries. In these rows we turn the water as it is delivered by the pump in a two-inch iron pipe, and divide it between ten or twelve rows at a time. Keep it running until thoroughly saturated. Then take another twelve rows and so on until the field is completed. We find that the next morning the surface of the soil under the plants is perfectly damp, the water having penetrated all under the plants without baking the surface. After three or four days the land has sufficiently dried to run a small harrow or cultivator between the furrows in which the water has been running. This watering will last from ten to fifteen days, according to the degree of moisture in the atmosphere. The effect is wonderful; all the fruit is well developed both in quality and size; so perfectly that nothing more could be desired. With ordinary care land cannot become hard and cloddy, but it should never be worked while it is wet. There is, however, one great drawback to be seriously considered, and that is if the land has been thoroughly irrigated just before the approach of a protracted rain storm, there are sure losses. The land being wet, a continued wet spell will cause fruit to rot; especially is this true with strawberries. There is, however, less danger where the soil is sandy and well under-drained.

President BERCKMANS: "Gentlemen, the essayist is before

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you, and, as is customary, if you desire to ask him any questions he will be glad to answer them."

Maj. RYALS: "How would it answer to run subsoil plows?"

Mr. DECKNER: "I should think that would be a good idea. It would do very well, indeed."

Mr. DUGGAN: "Do you continue to irrigate your strawberries after your crop is gathered?"

Mr. DECKNER: "This can be done, if necessary, but unless you want to irrigate the plants it is not necessary. The strawberry will take care of itself the balance of the season. Irrigation is only necessary for the development of the fruit during the ripening period."

Mr. LIGHTFOOT: "What kind of hose do you use?"

Mr. DECKNER: "We don't use any hose at all. We take the water from a pipe, and conduct it in narrow ditches to where we want it. You can use a hose, however, if you wish—the web hose, for instance; stitch it with pliers, and the water will run steadily through it, provided it ain't uphill. We find it very unsatisfactory, though."

Mr. LIGHTFOOT: "I have 25 acres in strawberries, and we have a spring on a hillside, and I wanted you to explain how we can use it on the plants."

Mr. DECKNER: "You would have to conduct the water in a ditch down to where you wanted it, or anywhere you please."

Mr. LIGHTFOOT: "The elevation will interfere in that instance. I think we will have to use a hose."

Mr. DECKNER: "Well, I have never seen a piece of land yet but a ditch could be carried perfectly level, if necessary. I have been irrigating for a good while. If you want to carry the water in a hose, though, you can do so; but it is more expensive, and the water will be of much more service, if your land will stand it, when carried in ditches."

Mr. W. D. HAMMOCK: "What did that engine cost with which you raised your water 75 feet?"

Mr. DECKNER: "Something over $200.00."

Mr. HAMMOCK: "That engine furnished you a supply of water for 20 acres?"

Mr. DECKNER: "Yes, sir."

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A MEMBER: "How far do you carry your pipe before you have the next opening?"

Mr. DECKNER: "You don't exactly get the idea. We turn the water into the rows, as it is delivered by the pump in a two-inch iron pipe, and divide it in ten rows at a time. We keep it running until thoroughly saturated. Then take another ten rows and do likewise, and so on until the entire field is irrigated."

Mr. WIGHT: "How long are your rows, Mr. Deckner?"

Mr. DECKNER: "About 300 feet."

Mr. WIGHT: "For longer than that you would have to have a new distribution of water, would you not?"

Mr. DECKNER: "Yes, sir."

A MEMBER (from Augusta): "I use city water, and I find that I am obliged to use my hose, and practically the limit of my rows is about 200 feet. In fact it's better in my case to have them only about 150 feet."

A MEMBER: "Does sandy soil absorb more than clay soil?"

Mr. DECKNER: "Yes, sir, sandy soil takes more water, and therefore the application must be more often. The application must be general over the surface, and when the water gets down to the depth you want it to go, then stop. In common soil the water goes down during the day, and rises under the plant during the night, and the next morning the ground is damp where it has risen during the night."

Maj. RYALS: "I have had some experience with this subject. When we prepare to irrigate, as a matter of course we thoroughly prepare the soil. We thoroughly fertilize, etc. Now in the early spring is there not considerably more danger on account of frost to vegetation than if water had not been used?"

Mr. DECKNER: "In reply to this I would say that, while there is danger in frost you will never find frost and drouth together."

Mr. WIGHT: "In your experience in irrigating strawberries you have doubtless noticed a part of the field that was not irrigated. Did you think to observe whether the irrigation doubled the crop, or trebled the crop, or what increase do you think came from the application of water during the dry season?"

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Mr. DECKNER: "I could not give you a definite answer to that. I have not observed closely enough to answer definitely."

Mr. MERRIAM: "It has quadrupled my profits."

Col. NEWMAN: "Mr. Smith, a farmer near Mobile, told me that the cabbage on his land after he had begun irrigation brought $400.00 an acre, whereas without irrigation he only got $200. It doubled his profits."

Prof. STARNES: "I do not like to overtop Col. Newman's statement, but there is a man by the name of Tiebout, out about 50 miles north of New Orleans, La., in Tangipahoa parish, who showed me the bills of sale of cabbage from 1 2-10 acres, and those cabbages sold for $900.00, and he had at the time a crop of corn on the same land, that we estimated would make between 70 and 80 bushels. It was all done by the water he put on it."

President BERCKMANS: "I wish to say, gentlemen, in corroboration of this, that results from irrigation are perhaps not understood any better anywhere than in the State of California. You have no conception of the results of irrigation there until you have seen it. The lines are distinctly drawn between irrigated land and that not irrigated. Right here you will have perfect vegetation, and right there—a few steps away—you will have arid land. Without the water California's fruit crops would amount to nothing at all."

The next paper was read by Mr. Herbert C. White, of DeWitt, Ga., entitled "Nut Culture in Georgia," as follows:

Nut Culture in Georgia.

BY HERBERT C. WHITE.

In Georgia nut culture has received but little attention, except, perhaps, from a very few. While we call Georgia the Empire State of the South, when it comes to the production of nuts she is very insignificant as compared, not only with the Empire State of the North, but with her sister States. But for the large production of peaches, Georgia would be outclassed with all other, so to speak, fruit growing States. In the production of nuts of all kinds, as returned by the twelfth census, only $3,997.00 worth of nuts were produced in Georgia—that is in 1899. In the same

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year the other "Empire State," (New York), is credited with $71,122. Florida reported value of nuts at $8,453, derived from cocoanuts (136,650 nuts), 46,800 pounds of pecans, 9,480 pounds of walnuts and 832 bushels of miscellaneous nuts. The nut production of Alabama aggregated $6,315, mostly from pecans (60,670 pounds). In Tennessee $5,828—pecans 7,810 pounds, and miscellaneous unclassified nuts 13,037 bushels. I give details of the production of these States to show that Georgia is not doing her best. For comparative purposes we will note the nut production of Louisiana, Mississippi, Texas and California. Louisiana reported a value of $51,457 in nuts, derived from 637,470 pounds pecans, 4,740 pounds walnuts and 471 bushels of unclassified nuts. The production of Mississippi was valued at $17,158, consisting of 242,300 pounds pecans, 5,670 pounds of walnuts and 1,313 bushels of miscellaneous nuts. Texas produced 1,810,670 pounds of pecans (56.4 per cent. of the entire pecan crop of the country), 10,400 pounds of walnuts and about 12,000 pounds of miscellaneous nuts, the value of the Texas crop in 1899 being $78,971. All States sink into insignificance in nut production beside California, where the value of all nuts in 1899 aggregated $1,441,137. This enormous revenue was derived from 6,992,610 pounds of almonds and 10,619,975 pounds of Persian or English walnuts. It is noteworthy that the entire crop of pecans in California in that year was only 1,220 pounds. Under the terms "miscellaneous" or "unclassified" nuts are comprised hickories, black walnuts, chestnuts, chinquapins, etc. I think it unfortunate that chestnuts were included in the miscellaneous list, although the growing of chestnuts has not yet assumed a very large scale.

Returning to Georgia, we find that every county in the State reported nuts in 1899. Lowndes county leads in value of nuts; Appling is a close second, with Mitchell, Fulton, Camden, Oglethorpe, Sumter and Decatur following in the order named. The production of all other counties, as reported, was quite insignificant. From my knowledge of the situation, I venture to predict a preponderating lead in favor of Mitchell and Dougherty counties, unless other counties wake up, when the next census is taken, and owing to the fact that the nut trees now planted, and to be planted, in Georgia, are of generally a far superior class to the wild trees of Texas that in the majority of cases are now and will continue to be cultivated. It would not surprise me if the value of Georgia nuts in 1909 is greater than that of Texas, even if Georgia does not produce as many pounds. Speaking of pecans, it may interest you to know that the total reported production in 1899 was 3,206,850 pounds, of which Texas produced 56.4 per cent., Louisiana 19.9 per cent. and Mississippi 7.6 per cent. No other State reported as much as 100,000 pounds and only Missouri, Kentucky, Arkansas and Alabama reported 50,000 pounds. The twelfth census developed the interesting fact that pecan nuts were produced in twenty-three States, as follows: Alabama, Arizona, Arkansas, California, Florida, Georgia, Illinois, Indiana, Indian Territory, Kansas, Kentucky, Louisiana, Maryland, Mississippi, Missouri, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia and Wash-

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ington. This goes to show that the range of successful pecan culture is not as limited as many suppose.

The total value of all nuts, so far as it was possible to obtain returns in 1899, was $1,950,161. Of this California produced 73.9 per cent. Of the bearing nut trees reported in the twelfth census 1,649,072 or 44.5 per cent. were almonds, yielding 7,142,710 pounds; 48,919 or 1.3 per cent. cocoanuts, producing 144,900 nuts; 643,192 or 17.5 per cent. pecans, 3,206,850 pounds; 726,798 or 19.6 per cent English walnuts, producing 10,668,065 pounds, and 634,460 or 17.1 per cent. miscellaneous nut trees, yielding 380,224 bushels.

The twelfth census was the first that attempted to obtain definite values of nuts and fruits, and while the information gained is of great value and interest to us, it is to be regretted that we have no means of making any comparisons with values in earlier years.

While I fear that the statistical information which I have already read may not appear to be directly related with "Nut Culture in Georgia," yet to get a clear conception of the magnitude of the country's business in nuts and to emphasize the small part Georgia is taking in same and to show that it is an industry of great promise, I must again worry you with a few figures upon the subject of the importations of nuts from foreign countries. In 1897 $2,200,161 worth of nuts were imported. In 1898 $2,333,938, and in 1899 $2,727,542. You will note that $493,604 more nuts were imported in 1899 than in 1898. I have within the last two days been furnished with figures covering the importations of nuts for the year ending June 30, 1902, and find that in that year $2,826,746 worth were imported. The increase in the importations in 1902 was $99,204 more than in 1899. It must be remembered that these imported nuts are subject to a heavy duty in most cases. The duty on almonds, not shelled, is four cents a pound. On shelled almonds, 6 cents. On filberts, not shelled, 3 cents. On shelled filberts, 5 cents. On walnuts, not shelled, 3 cents. On shelled walnuts, 5 cents. To these charges must be added freight, insurance, brokerage and retailers' profits. It is not difficult to see that there is a good field for profitable nut growing if the right locations and trees are obtained and some care taken in culture. The American production of nuts does not keep pace with the increasing demand.

NUTS AS FOOD.

Nuts have passed from a "luxury" to almost a necessity in the diet of many persons, since their great food value has been discovered. The country today is flooded with literature upon the subject of health foods. One of the best patent food preparations has deemed it advisable to suffix its commercial name with the word "Nuts." The interest in nuts as food caused the Maine Experiment Station in Bulletin No. 54 to publish much valuable information upon the subject, after careful analysis of the principal nuts. The introductory paragraph to this most interesting treatise reads as follows:

"While the use of nuts in this country has already attained considerable

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proportions, it is believed that a careful study of their food qualities would lead to a largely increased consumption."

They also say:

"The vast range of climatic conditions to be found in this country will enable us to grow nearly all the nuts which we now import."

By far the larger quantity of nuts imported is from Europe, principally from Spain, Italy and France. Stretching from the Southern boundary of Georgia to its Northern limits are to be found soils and climate perfectly adapted to the successful raising of all those nuts imported from Europe, consisting of chestnuts, walnuts, almonds, hazel nuts and filberts. I do not mean to say that all these varieties of nuts should be planted indiscriminately here, there and everywhere; but I do say that there are greater or less areas in Georgia in which any of these nuts will thrive. The chestnut thrives best on high land and the consensus of opinion is that it prefers dry, rocky, sandy or gravelly soils to those of a richer and more compact character. Have we not lands of this kind in Georgia? The walnut at present has not been an unqualified success in the extreme lower South, but there are places in North Georgia and even in Middle Georgia where one should not hesitate to plant walnut trees. In the case of almonds, possibly the area of profitable culture in Georgia is more restricted. In California the almond is planted principally on bench or hillside situations. The tree grows wild in Syria and northern Africa and is there found in dry and stony locations and is capable of enduring considerable drought. The hazel and filbert, somewhat indiscriminately designated, have probably received less attention than any other variety of nut in this country. In the main, their culture has not been successful, on account of the small and desultory way in which tests have been made. The cultivation of the hazel, cob and filbert is extensively carried on in England. Spain also produces a nut of this kind known to the trade as the "Barcelona nut." Most of the "hazel" nuts we buy in the so-called "mixed nuts" from our grocery stores are raised in Spain. There is no reason why the Spanish tree should not find a congenial home in some parts of Georgia. My idea upon the subject is, that every farmer and fruit grower in Georgia should have a small experimental plat upon which careful and intelligent tests should be made of all nuts as to which any doubt exists as to their suitability to the location. The cost would be trivial and great material benefits would undoubtedly accrue. The areas in which walnuts and almonds in California are the most profitable are very restricted and it was as a result of experiment that these ideal locations were found. Why cannot we find areas in Georgia, even if only small ones, where the almond and filbert will be congenial, and consequently profitable? Three counties in California produce nearly all the 10,000,000 odd pounds of walnuts raised in that State. We need not hesitate to plant improved and selected pecan nut trees. They will grow on a wide range of soils and where care has been given them and a judicious selection of trees made, are today very profitable. One of the largest pecan groves in the South has been planted in Mitchell county by a gentleman from New

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Orleans, who has had abundant opportunity to observe the pecan in Texas, Louisiana and Mississippi. He finds that the pecan in Georgia will bear earlier, that the nuts are better flavored and better filled, and that there are fewer insect enemies here than in either of the States named. Surely this is encouraging. There are now, and will continue to be, disappointments in pecan culture. The subject, however, today, is better understood than it was. Today we can have budded and grafted trees of the choicest standard varieties, and, as is the case with all budded and grafted trees, a certainty of product and earlier bearing. Pecan trees of all ages bearing inferior nuts can be converted to bear the very choicest varieties by top working them with buds or grafts, and will frequently bear the new variety the second year.

I consider that it would be wasting your time to go into much technical detail concerning the propagation or culture of nut trees, inasmuch as most of you are practical horticulturists. It is of course a fact that different species of trees require different treatment to obtain the best results, yet the principles of successful fruit tree culture remain the same and may be summarized as follows:

(1) The selection of a suitable site for the orchard.

(2) An intelligent selection of varieties adapted to the climate and soil, with a reasonable certainty that you are buying healthy trees absolutely true to name.

(3) The proper preparation of the ground and planting of trees.

(4) Suitable fertilization and culture.

(5) A constant watch for insect enemies and disease and the taking of immediate steps to remedy the trouble.

I would suggest that none but expert and experienced men be engaged to top work old pecan trees, or young ones, for that matter, even if seemingly high prices are charged; as owing to the fact that one must have a thorough knowledge of the tree, and very few having given the matter special study, great waste of time and mutilation of trees will usually result where novices are employed.

It may not be amiss to say a few words as to fraudulent practices in the sale of nut trees. There are men operating in the State of Georgia, and neighboring States, who with a few freaky, greasy nuts as samples, will sell you one year seedlings (bought anywhere), yet represented to be raised from such nuts as they show you. They will guarantee these trees to live. They will guarantee them to bear in two years and they will guarantee them to come true to seed. We all know that this is a fraudulent misrepresentation of facts and in many respects utterly impossible. As chairman of the Committee of Ethics of the National Nut Growers Association I have had a number of matters of this kind referred to me during the past year and the Association will endeavor to take such steps as to make the fraudulent sale of trees impossible. The National Nut Growers Association was organized at Macon last October and much good and stimulus to the industry has resulted, chiefly through the "Nut

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Grower," the official organ of the Association, ably edited by the Secretary, Mr. J. F. Wilson, of Poulan, Ga.

Another matter which should be vigorously taken up by all agricultural associations in Georgia, and this Society in particular, is the enforcement of the State laws regarding the inspection and fumigation of all nursery stock, as well as cuttings, scions and buds imported into this State. In my own experience, most serious insect pests have been introduced into certain localities in Georgia following the receipt of insect-infested scions from other States. We are greatly indebted to our Chief Entomologist, Mr. W. M. Scott, for his most energetic efforts to enforce the law.

In my opinion, farmers, peach growers and others are losing opportunities by not setting out pecan trees on their farms and among the peach trees. Trees set fifty feet apart in our cotton fields would not in any appreciable degree interfere with farming operations for years, and long after they come into bearing. With the Southern trend of immigration, lands planted in trees, if for the timber alone, will assuredly prove more attractive to settlers and command higher prices than large areas devoid of timber and shade.

In Georgia there are thousands of acres of hillsides and waste lands, and decadent peach orchards, fence rows and roadsides which could most advantageously be planted in nut trees, and there is no reason why nut culture in Georgia should not be one of its most solid and enduring industries.

In conclusion, I want to thank you, ladies and gentlemen, for your patience in listening to this perhaps too lengthy paper.

Mr. W. D. HAMMOCK: "I wish to ask Mr. White about what age will the pecan bear?"

Mr. WHITE: "Do you refer to a seedling tree?"

Mr. HAMMOCK: "Well, what kind will bear the earliest?"

Mr. WHITE: "I have seen grafted trees bear the second year, though this is very uncommon. It is very common, however, for them to bear the third and fourth year. Seedlings bear in from 5 to 10 years."

QUESTION: "Which is the most lasting tree?"

Mr. WHITE: "Time alone can determine that. There is every reason to believe that the pecan is very long-lived. One tree I know is 70 years old and is bearing each year."

QUESTION: "You state, then, that with proper culture grafted trees ought surely to begin to bear in five years."

Mr. WHITE: "Yes, sir, easily."

Mr. MERRIAM: "What about elevation above sea-level?"

Mr. WHITE: "I am rather inclined to think that South Geor-

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gia is a better field for pecans, perhaps, than the mountainous region."

Col. I. C. WADE: "Is not the largest pecan tree in the State in Habersham county?"

Mr. WHITE: "I have heard of that tree, sir, but I was under the impression that the largest tree is in Liberty county. That is four feet in diameter."

Col. WADE: "Well, that is larger than the one in Habersham county. I believe it's only about three feet in diameter. It has been bearing for 60 or 70 years."

A MEMBER: "I would like to ask, if the tap-root is cut off, will it materially affect the tree?"

Mr. WHITE: "If it affects it at all, it would be most beneficially. The theory that the loss of the tap-root ruins the tree is absolutely exploded."

QUESTION: "What variety of pecan do you prefer, the paper shell or —?"

Mr. WHITE: "That term 'paper-shell' applied to the pecan means nothing. It is not specific enough. The committee on nomenclature of the International Nut-Grower's Association have that matter before them now."

QUESTION: "I am thinking of planting ten acres in pecans. How far apart ought I to plant them?"

Mr. WHITE: "Put them not nearer than 40 feet apart."

Col. WADE: "Can you tell me about what per cent. of trees grown from the nuts would follow the original tree? I am raising some that way, and I would like to know what percentage would prove true?"

Mr. WHITE: "The experience of old nut-growers is very variable. There is no way, of course, of foreseeing what a seedling tree will do."

Col. WADE: "Well, is it as great as 65 to 75 percent.?"

Mr. WHITE: "Well, I would be afraid to risk it."

Maj. RYALS: "Are there any people in the State of Georgia that really realize any money to amount to anything from growing pecans?"

Mr. WHITE: "Yes, sir. Mr. G. M. Bacon, of DeWitt, Ga., gets a very nice income; I mean from the nuts."

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Maj. RYALS: "He has quite an extensive orchard, has he not?"

Mr. WHITE: "Yes, sir, between 30 and 40 acres. I don't know exactly, but I can approximate his income from those 40 acres. The yield last year was close upon 5,000 pounds at varying prices from 10 to 50 cents. Last year was a very poor year for pecans, too. Last year was really not a fair criterion. The pecans were small, and the crop was short."

Maj. RYALS: "My reason for asking these questions is that some six or seven years ago I bought a piece of land with some pecan trees supposed to be 25 years old. I have not got enough pecans off of them for my family use."

Mr. DUGGAN: "How large is your family?"

Maj. RYALS: "Well, the overseer's family consists of one wife, and he had two children."

A MEMBER: "Why say South Georgia rather than North Georgia is best for the pecan? The tree product of South Georgia is the long leaf pine. Would it not be more natural for the pecan to grow in North Georgia, where other hardwood trees grow?"

Mr. WHITE: "In speaking of North Georgia I had in mind particularly the mountains. I believe the pecan should be cultivated, and, if you can find level lands in North Georgia, I should think they would thrive there well enough. We find them growing in Tennessee, Illinois, Indiana and Ohio. I had in mind the mountain regions of North Georgia—the slopes and hillsides, where it would be difficult to cultivate."

Col. WADE: "Yet these slopes and hillsides are covered with hickory. Does not the pecan grow out in Arkansas among hardwood trees?"

Mr. WHITE: "Yes sir."

Col. WADE: "The idea I want to bring out is this: that North Georgia is the most natural climate for the hardwoods. It is certainly the home of the hickory. I cleared off a place up there a short while ago, and every tenth tree, nearly, was a hickory tree."

Mr. WHITE: "As I said, I had in my mind the mountain slopes. It would be very difficult to cultivate the pecan on these hills."

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Mr. MERRIAM: "Is it not true that planting different varieties together would make the trees yield better?"

Mr. WHITE: "There is a great deal in that. I don't know but that Major Ryals might be benefitted by that. I don't know what happens to Major Ryals' trees. Perhaps the trouble is his foreman or his foreman's wife."

Pres. BERCKMANS: "You must remember that the principles of botany play their part in the fructification of pecan trees. Botanically the pecan tree is classed as monoecious, or producing both male (sterile) and female flowers upon the same tree. During some years the male flowers mature before the female flowers and cast their pollen before the female flowers are sufficiently developed to be fecundated. Again heavy rains may wash the pollen away. Hence the crop of nuts is affected."

Mr. MERRIAM: "I want to ask if different localities have any effect upon the different varieties of pecans?"

Mr. WHITE: "No, sir. If one pecan tree will grow in one place, another one will do just as well there."

A MEMBER: "Do pecan trees grow, budded on hickory?"

Mr. WHITE: "Yes, sir, will form union perfectly."

Mr. DUGGAN: "Would it endanger the old tree, if the budding proved a failure?"

Mr. WHITE: "No, sir, the tree would put out new sprouts and new growth below where the injury was made."

President Berckmans then presented Prof. H. N. Starnes, who addressed the Convention on the subject, "The Georgia Fig—Its Possibilities and Promise."

The Georgia Fig—Its Possibilities and Promise.

BY PROF. H. N. STARNES.

Mr. President and Gentlemen:

The urban population of our State has of late attained considerable proportions and we now have quite a number of municipalities of respectable size, beginning with the metropolis of Atlanta and including, in order, Savannah, Augusta, Macon, Columbus, Athens, Brunswick, Rome, Americus and Valdosta; moreover the demand of the citizens of these communities for novelties in the way of luxuries and the means for the indul-

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gence and gratification of elaborated tastes have also expanded with equal pace.

For this reason it is now possible to find home markets within easy reach for commodities heretofore almost unknown to commerce and consumed only where they happened to be casually grown—fruits which the commission houses have always "turned down" in the past—such as the scuppernong and the fig—because of their poor shipping capacity and the slight demand existing for them in smaller and heretofore relatively moneyless communities.

Now a substitute for the scuppernong may possibly be found in other grapes, but the fig is *sui generis*. It stands alone and nothing can take its place. It is customary to assert that a taste for the fig is acquired, like that for bananas or olives. This may be true in regard to Northern communities, but it is as difficult to find a Southerner who doesn't like figs as it would be to discover a Georgia darkey repudiating fried cat-fish and watermelon on the Fourth of July, or 'possum and potatoes at Christmas! With us it is a natural taste, and housekeepers with means in the larger Georgia towns would buy figs readily enough—if they could get them. It is the steady increase in the number of these would-be purchasers that today emphasizes the value of the fig as a commercial possibility of the future.

Yet it is to the shipment of selected

FRESH FIGS.

to the larger towns and to the consumption of inferior grades by canneries that the industry must look for present success. In Mississippi there already exist extensive canneries putting up preserved figs, and it is said to be a profitable and growing industry. Capital will always follow profit, and with an assured supply of this fruit it would not prove difficult to induce Baltimore and Philadelphia money to "come our way"—especially as the bulk of the fig crop immediately follows that of the peach crop.

DRYING IS IMPOSSIBLE.

with profit on a commercial scale in our climate, at present, and will always be, unless the development of the Smyrna fig in future should exceed our most enthusiastic anticipations.

That the fig has not sooner received more attention in Georgia is not due to the fact that it cannot be successfully grown, but mainly to general unfamiliarity with its characteristics and habits. It is entirely at home throughout the "Wiregrass" and the whole of Southern Georgia; thrives fairly well over the red clay cotton belt (the metamorphic region) of Middle Georgia and even in the northern part of the State, except in the mountains proper, may be safely grown with moderate winter protection.

That it has not been more largely planted in even its natural habitat—the coast counties—may be explained, possibly by

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THREE REASONS:

1st.—The small demand for it in the past—now no longer a valid objection.

2d—Its want of adaptability to orchard culture and conditions.

3d—Its soft and pulpy character, which renders it so poor a shipper.

Nevertheless, if not over-ripe, the fig will readily carry in berry cups or trays a reasonable distance—sufficiently far, at any rate, to supply our local markets. Yet it cannot be denied that the sugar content of the fig exists in a very unstable form and rapidly breaks up into acetous (and even putrefactive) fermentation, and this is a great drawback to successful shipment. It must be picked fully ripe to be worth eating and cannot be gathered prematurely like the peach or plum. But a day's wilt improves its character and increases the sugar content, provided it is carefully handled. After twenty-four hours, however, the danger line is reached and fermentation is imminent. It must therefore be handled rapidly as well as tenderly. When this is done there is no more delicious morsel known to horticulture—given, also, the proper variety and soil and a favorable season—quite a formidable combination of prerequisites!

A rainy season during the ripening period spells ruin. The fig needs moisture, it is true—plenty of it—but it insists on taking its supply through its root system and elaborating it in its own way and at its own pleasure. It does not want its water in the way a good Baptist likes it. It abhors immersion and even objects to sprinkling. Too much atmospheric moisture not only cracks and splits the fruit, but immediately superinduces fermentation—what is known as the "fig sour." Even too much underground moisture will tend to split the ripening fruit through the rapid expansion which it produces. A dry season is therefore to be preferred by the fig grower to a wet one.

While the fig has not responded profitably to wholesale

ORCHARD PLANTING.

it has been and may be very successfully grown for family use—with some to spare—and every back yard in the State—at all events throughout Middle and South Georgia—would be the better for a dozen fig trees. The fig is essentially a surface feeder; its root system is shallow and peculiarly sensitive. Everyone who has propagated it realizes how dangerous it is to permit the roots to dry out during transplanting, or even to expose cuttings for any length of time above ground. Their porous character permits such excessive transpiration of moisture that their vitality is easily impaired. Consequently the disruption of the shallow root system by the plow in orchard cultivation is extremely injurious, while it remains practically undisturbed and intact under the harder surface of the back yard and around the home premises. Banishing the plow altogether from the fig orchard would of course obviate this difficulty, but, with the hoe left as the only means of cultivation, it is evident that the cost of maintenance would be greatly increased. Even so the "end will justify the means" where there exists an active home market. Yet even this is not necessary,

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for the shallowest soil stirring is practicable when the "narrow toothed" (or "twelve toothed") cultivator, with rear leveler, or rake, is used. Deep plowing is ruinous; mere surface stirring is harmless; no other obstacle stands in the way of orchard culture.

Distance depends mainly on latitude. In upper Georgia, where the trees are small, ten feet apart, each way, or at most, ten by fifteen feet, will be found sufficient, while greater space is advisable where the trees assume larger proportions. Fifteen by twenty feet, however, may be regarded a maximum even for Florida or the coast.

FERTILIZATION.

Though a surface feeder the fig is yet a gross consumer of plant food and requires, in consequence, liberal nourishment and a strong, rich, yet warm and well drained soil. Second bottoms form an ideal location; and for this reason it generally thrives in garden plats, and about the back door of dwellings, where refuse accumulates and serves to nourish it, and where there is more or less moisture. Lime is essential to perfection, it superinduces rapid nitrification and should be artifically supplied in freestone formations.

A good annual mulching of well rotted lot manure is the best fertilizer that can be given, supplemented, where the growth of wood is lusty and vigorous, by the addition of phosphoric acid and potash in the form of acid phosphate and muriate of potash or kainit or wood ashes. Five pounds of acid phosphate and two pounds of muriate of potash, broadcast, per tree, will not be too much. Eight pounds of kainit or a peck of unleached ashes may be substituted for the muriate. This will induce vigorous fruiting if applied in the late fall or early winter and worked in with pronged hoes.

Where stable manure is not readily obtainable any good potato or onion fertilizer analyzing 3 to 4 per cent. of nitrogen, 8 per cent. of phosphoric acid and 6 or 7 per cent. of potash will give excellent results, using from five to eight pounds, broadcast, per tree, according to size. Even a good standard cotton formula would suffice.

INFLORESCENCE.

Before going further into cultural details it may be well to explain the differentiation of the fig due to its peculiar method of inflorescence.

The fruit of the fig, as everyone knows, is a hollow, pyriform receptacle, on the interior surface of which are located the flowers. These are of four kinds:

1. STAMINATE or Male—bearing pollen, but of course with no seed carpel at their base.

2. PISTILLATE or Female—with well developed ovaries or seed carpels, but unless pollinated incapable of development.

3. GALL Flowers—sterile organs, whose only province is to harbor or shelter the *Blastophaga* or Fig Wasp; and

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4. MULE or Sterile Flowers—incapable of performing any function whatever.

These four kinds of flowers give rise to the four classes into which figs are divided, viz.:

1. *Adriatic* Figs.
2. *Smyrna* Figs.
3. *Capri* Figs.
4. *San Pedro* Figs.

1. ADRIATIC FIGS, to which class belong all of our Southern figs, all California figs (until the very recent introduction into that State of a few Smyrna figs) and most of the European varieties, constitute the largest and most widely distributed class, and to us the most important. They have "Mule" or sterile flowers, only, but nevertheless the receptacle or pulp develops into an edible fruit, with pseudo or false seed carpels, which are altogether incapable of germination. Consequently no seedling can ever originate from our American figs—they belong to the Adriatic class—a true "Mule" type.

2. SMYRNA FIGS. These were, as their name indicates, Asiatic in origin though now largely in culttivation over Southern Europe. They contain only "Pistillate" or female flowers. These, if pollinated (naturally or artificially) swell and grow, developing into the finest figs known to commerce. Unpollinated, they dwarf, shrivel and finally drop off. Pollinated Smyrna figs dry readily even in a semi-humid climate like that of Italy, Southern France, Spain or California, and even in Florida and South Georgia present our only chance or hope of ever developing this branch of the fig industry. "Mule" figs dry successfully in a rainless region, but here their profitable manipulation would be impossible. That is to say, the product, as compared with European or California dried figs would be found so inferior that the attempt would have to be abandoned. Pollinated Smyrna figs acquire a rich, aromatic, nutty flavor that is exquisite in the fresh product and extends even to the dried article. The first grades of commercial dried figs are all of the Smyrna class. Quite recently their culture has been introduced on a small scale into California —the pioneer in the work being George C. Roeding, of the Fancher Creek Nursery, at Fresno. Yet without the close companionship of the next class—"Caprifigs"—the Smyrna fig would be valueless, as self pollination is of course impossible.

3. CAPRIFIGS, or "Wild" figs were evidently the prototype of the entire race. They rarely develop edible quality and their province in nature is evidently to serve as pollinators for the Pistillate division. This they effect in a most peculiar manner. The Caprifig bears three kinds of flowers: "Staminate" or Male, clustered in a compact mass around the interior rim of the "eye," their anthers blocking the exit like a screen of brushwood. The rest of the interior surface of the receptacle of the Caprifig bristles with "Gall" flowers (together with some "Pistillates.") In the base or false ovary of the Gall flowers the egg of the *Blastophaga psenes* or "Fig Wasp" (a minute insect) is deposited, hatches and develops

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to maturity. The wingless males emerge first and with their powerful mandibles cut into the flowers containing the female wasps, partially release and impregnate them. The gravid females shortly complete the liberating process, and, being winged, at once seek to escape for the instinctive purpose of ovipositing. They emerge from the eye of the Caprifig, after squeezing through the mass of pollen-covered anthers protecting the exit, and seek a new fruit in which to lay their eggs. Ordinarily they would naturally enter the nearest Caprifig in the proper stage of development and there oviposit. But meanwhile, if the Caprifig containing the colony has been plucked from its own stem and suspended in the branches of an adjacent Smyrna tree, the female insect, on emerging, forces her way into a fruit of the latter class, losing her wings in the process, and at once begins a frantic scramble around the interior, searching for the anticipated Gall flowers, in which to oviposit. Failing, necessarily, to find them, she finally curls up and dies heartbroken, but not until she and her companions have between them pretty thoroughly pollinated every female flower in the cavity with the plentiful store of pollen conveyed from the Caprifig—thereby ensuring the development of the fruit.

It is in this way that Smyrna figs are artificially pollinated—the process being termed "Caprification" and requiring, of course, the parallel cultivation of a sufficient number of Caprifigs to furnish the necessary quantity of *Blastophaga* to pollinate the pistillate Smyrna figs. Seed of Smyrna figs so pollinated (and even the seed of dried figs, when of the Smyrna class) are capable of germination, and from their planting it is possible to originate new varieties—a field of work that at no very distant day will offer brilliant opportunities to the patient experimenter.

4. San Pedro Figs. These form a unique class, the first crop of which consists entirely of "Mule" figs, which are edible, while the figs of the second crop contain only "Pistillate" or female flowers and therefore invariably drop off before maturity, unless "Caprified" like Smyrna figs.

The following table summarizes the entire classification of the Inflorescence of Figs:

Summary:

Class.	*Flowers.*
1. Adriatic	"Mule" or Sterile.
2. Smyrna	"Pistillate" or Female.
3. Caprifigs	"Pistillate" or Female. "Staminate" or Male. "Gall" or Wasp Cells.
4. San Pedro	1st Crop—"Mule" or Sterile. 2d Crop—"Pistillate" or Female.

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PROPAGATION.

The fig propagates readily from cuttings. They may be taken either in late winter, just before the sap starts, and after all danger from severe frost is past—in which case they may be at once set out in the nursery row, with the terminal bud even with the surface of the ground—or they may be cut earlier in the season and bundled and buried, as with grape cuttings. In either case the cuttings should be long, consisting of six or eight buds and in diameter from the size of a lead pencil to that of the little finger. Long cuttings have a better chance to strike root in moist soil than have shorter ones. The cuttings may be sometimes planted with advantage in the place the tree is to permanently occupy. If conditions are favorable and the cutting grows off promptly it may make a growth the first season of from three to six feet. A few figs may be obtained the second year and the third season a good crop should result. When planted in its permanent place if the cutting (or a rooted plant from the nursery row, either) fails to grow off well at the start it is useless to leave it; it is not likely to ever develop into a vigorous plant; something is radically wrong with its vitality and it is better to root it out and replant. In transplanting only the most healthy and vigorous specimens from the nursery row should be used—and this is one advantage in using rooted plants. On the other hand a year's time is frequently saved by using cuttings. Only the less vigorous need be replaced. In orchard planting, however, it is somewhat difficult to protect the cuttings placed *in situ* during the earlier stages of their growth, and this consideration frequently induces the owner to select rooted and therefore larger and more conspicuous plants.

In handling fig cuttings and rooted plants, both for home use and shipment, neither the cuttings nor the roots should be permitted to dry out; if so, they are worthless, for they never recover their moisture like other plants.

STRUCTURE AND ANATOMY.

The fig bears its fruit, as a rule, on the last growth of wood which it has made. This frequently occasions double crops in this latitude—sometimes more in subtropical climates. The first or early crop, termed "Brebas," is set on the last developed wood of the previous year—on what, in the nomenclature of the vine, would be termed "canes," but is frequently winter killed in embryo, and therefore fails to materialize. The second or main crop is chiefly set on the new wood of the current year (the "shoot" with the vine) which has of course to push out from the "cane" of the previous year before the fruit becomes visible. It is thus protected in the undeveloped "shoot" from all danger of winter killing, unless the cold is so severe as to destroy the "cane" itself, and in consequence the second crop is reasonably sure. With all figs of the Adriatic class both Brebas and the fruit of the second crop are of course "Mule" figs and unfertile, though edible. With the San Pedro class the Brebas are "Mule,"

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while the second crop, as already stated, having female flowers only, fails to develop, and the young fruit drops before it is half grown. This class has therefore only one crop—the Brebas—but it includes some of the best and most delicate varieties. French gardeners make of them a specialty at high prices for the tables of wealthy Parisian epicures.

PRUNING AND TRAINING.

Little pruning is needed with the fig and that little is formative only and for the purpose of ventilation. In lower Georgia, where severe freezes seldom cut down the growth, it is customary to develop a single, central trunk—giving the plant the true tree form. In Savannah, Brunswick and even Augusta, ante-bellum fig trees sometimes towered as high as third story windows. Further up the State, where the wood often winter-kills, the "bush" or "shrug" form, in place of the arboreal, becomes necessary—leaving several separate canes from a common stool to grow diagonally upward. This insures a maximum output of fruit in a minimum time and also speedy re-establishment in case of injury from blizzards. So uncertain have climatic conditions become since the wholesale destruction of our forests that this precaution is now becoming more and more necessary in latitudes formerly exempt from serious injury. A simple way in which to start such a stool is to plant two cuttings (or rooted trees) instead of one, placing them "back to back." This forces diagonal growth from the start.

A cardinal rule to be observed in pruning is never to "stub-back" a limb. When thinning is needed for light and air it is getter to remove the entire cane or arm.

WINTER PROTECTION.

In extreme North Georgia, beyond Atlanta and the Chattahoochee, it is always necessary to protect in winter against possible damage by a screen or wind-break on the west and northwest, composed of either trees, buildings or fences. Indeed this is desirable even in Middle Georgia. A good location for a fig row will be found on the south or east margin of a protecting strip of woods, though not so near the trees, of course, as to permit them to rob the figs of their own moisture and plant food. A southeastern hillside exposure is also advantageous. A close board fence or building makes an excellent windbreak. In lieu of these a hedgerow of Cherokee or Macartney rose, or anything of that sort will serve. A double row of Carolina poplar makes a good substitute, on account of its inexpensiveness and rapid growth, for it propagates from cuttings more readily than the fig itself, and grows much faster. As it is deciduous, however, it serves only partially as a protection at the time protection is most needed. Some such evergreen material as Amoor River Privet, though not so rapid in growth, is yet a more perfect windbreak.

In the mountains it is necessary to adopt the northern plan of starting a number of slender canes, sufficiently flexible to bend over and admit of a covering of earth during bitter winter weather. This requires some

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pains, but the labor is well worth while where one cares much for the fruit.

MALADIES.

Fortunately the fig is tolerably exempt from serious maladies and affections. Few insects and fewer fungi attack it and its worst enemies appear to be those depredating on the fruit—birds and june bugs predominating.

One fungus, in particular, seems to give some trouble—a root rot (*Ozonium auricomum*) which so far I have noticed only on varieties of the San Pedro class at the Experiment Station—and these are fortunately our poorest representatives of the entire species—whatever excellence they may attain in Europe.

On some soils nematodes (*Heterodera radicicola*) occasionally prove injurious. The best remedy for both these maladies is the mattock. Cut out remorselessly the affected individuals and if possible locate the entire fig plat elsewhere. If this cannot be done, nitrate of soda, used as a top dressing, may lend sufficient temporary vigor to the affected trees to "keep them going" for awhile. But such treatment would prove a short-sighted policy in the end and would serve to invite widespread disaster, as it would permit both fungus and worms to thoroughly intrench themselves, and eventually extend over the entire plat. Immediate destruction would prove far more economical.

VARIETIES.

Experience with varieties differ so greatly with the locality that a definite recommendation is difficult if not inadvisable. Many considerations regulate a choice. In North Georgia, only the hardier varieties, of course, should be selected, without reference to quality. It is a question of what we can get—not what we would like to have. *Brown Turkey* is perhaps the most suitable variety for this section, and it is by no means a bad selection anywhere, for it is a persistent "Breba" setter, on account of its resistance to cold, a heavy bearer with its second crop, vigorous, healthy, a rapid grower, and its quality is quite good. Its bearing season is prolonged and it is a reasonably good shipper. It is not, however, early, nor of particularly handsome appearance.

As we proceed southward the list presented for selection gradually enlarges—the more tender varieties becoming available. Among the first-early sorts should be mentioned *Madeleine* and *White Neyreii*—the two almost identical, if not absolutely synonomous. Both are yellow figs, medium to large in size, sugary, and of very good quality, though soft and spongy. They are both superior to *Lemon,* considerably earlier, quite resistant to "fig sour" and ripen their second crop at the Experiment Station about July 20.

The well known *Celestial* follows immediately, with *Black Provence* (*Black Marseilles*) close on its heels, and both continue in bearing until late in September. *Celestial* is of better quality than *Black Provence,* but both have tough skins, and bear handling well. Their season is prolonged,

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which is an important feature in a fig, and but for their small size they would stand at the very top of the fig list.

Another good second early fig is *Golden Narbus,* but its season is short. *Magnolia* and *Dalmatian*—brown figs of very large size, and absolutely identical, so far as I can detect, are not suitable to this part of the country. Their earliest fruit is fairly good, but later it splits and sours fearfully, and whatever may be said of it in other regions *Magnolia* seems worthless here.

White Marseilles, said to be the best variety for attempting to dry, is inferior to *White Adriatic,* which follows it in maturity, and both are inferior by far to *White Ischia.*

Lemon, the old stand-by of the Wiregrass region, comes next, and is possibly more widely planted than any other variety except *Brown Turkey* and *Celestial.* It sours, however, too readily in most localities for thorough dependence to be placed in it, and its quality is also rather inferior.

But the best of the entire list, varying from midseason to late, is *White Ischia. Black Ischia,* its sister, closely resembles it in everything except color and productiveness. The quality of both is the very best; the pulp is bright red, and extremely sugary and high flavored, while the seed, instead of being soft, crackle crisply between the teeth, like those of a dried fig, with a most delightful savor. Left on the tree in dry weather, instead of souring the fruit will shrivel and dry, becoming a bag of sugar —a natural bonbon! Too much cannot be said for its quality, and the growth, vigor and health of both varieties are also perfect. But *Black Ischia* is a shy bearer, while *White Ischia* is extremely productive. Both are hardy and stand considerable cold.

While accused of splitting and cracking in some localities *White Ischia* has never been otherwise than perfect at the Station, even in the most trying weather, and it is pre-eminently our favorite.

Among the late varieties are *Brown Turkey,* already mentioned; *Blue Genoa* and *Hirtu du Japon*—one of Normand's introductions. It is of dwarf habit, an extremely slow grower, but said to be very productive. Yet it is greatly over-rated, for its fruit is hard and insipid, never ripening up properly.

Brunswick, a much vaunted late fig, of enormous size—as big, almost as the old-time *Alicant*—does not do well here. It is a shy bearer, and its fruit does not present that excellence of quality attributed to it in some other sections.

The foregoing presentation is the result of the Station's experience and the verdict of the public generally, so far as we can ascertain the average concensus of opinion. But every grower has his own individual preferences, and we are constantly forced ourselves to change our ratings and both amend and emend from time to time.

All of these figs belong to the Adriatic type, which is the only class so far grown in the South. None of them dry successfully, and it is by no means certain that even with the Smyrna fig the drying process can be made profitable in our humid climate. The United States Department of

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Agriculture is arranging to furnish a limited supply of the *Blastophaga* for colonization to anyone in Florida or South Georgia who has made a sufficient planting of Smyrna and Caprifig trees, and has brought them up to bearing age. It is therefore possible that in a few years, although we may never succeed in profitably establishing the dried fig industry, we may yet be able to place upon our tables a dessert fruit, the like of which has never yet graced them, and to whose glories even the *White Ischia* would be no more comparable than a ruta-baga turnip to a *Seckel* pear.

President BERCKMANS: "Gentlemen, this is a most interesting paper. Some of you may desire to ask some questions of Prof. Starnes," (After an interval): "You have so completely exhausted the subject, and so fully and satisfactorily done your duty in presenting so admirable a paper, Professor, that we will excuse you. It was certainly a very excellent lecture, and we thank you for it."

On motion the report of State Entomologist Scott was postponed until tomorrow morning.

President BERCKMANS: "I am sure, Prof. Scott, that most of our members would be delighted to know at what time your lecture will be delivered, so as to be present."

Prof. SCOTT: "I think they all ought to be present, no matter who is going to speak. If it suits all parties, however, we will put it at 11 o'clock."

President BERCKMANS: "We have the pleasure of having one of the oldest members of our organization with us today. He was formerly our Secretary, and one of our most valuable members, and it is my pleasure to say that he has consented to make a few remarks to the Convention. I take pleasure in presenting Prof. Newman, of Clemson College, S. C."

Prof. Newman gave a very interesting talk upon the subject of beautifying the school houses and school yards, and creating in the minds of children a love of nature, a love of agriculture, a love of horticulture, as well as training the mind to see the useful and beautiful in all things.

The speaker suggested that the child should be taught God's natural laws through Nature itself, that pleasant surroundings and nature studies would make his mind of a normal caste, and develop a healthy mind and brain, capable of the highest thought and achievement.

Prof. Newman insisted that it was the duty of the present

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generation to provide better school houses, better teachers, better studies, for the generation which is to succeed us, and to train the child in material and spiritual lines by touching him with the beauty of nature and with the symmetry and beauty of God's wonderful works here.

President BERCKMANS: "I hope that every member will go to work to see if he cannot make the school house in his neighborhood more attractive."

Mr. DUGGAN: "As a word of encouragement to Mr. Newman, and to this Association, allow me to say, as one representing the school interests of one county in Georgia, that at least one middle Georgia county has made an earnest effort toward establishing school gardens in connection with the rural schools in that county, and as a result of a contest along this line a large 20 ft. U. S. flag now floats over the old Mt. Zion School, in Hancock county, which was won by that school for excellence in this line of improvement."

Prof. NEWMAN: "I am very glad indeed to hear such a report from my old county. I lived in Hancock county, Georgia, for eight years."

The President then called attention to the "Question Box" as an important feature of the meeting, asking the members to take advantage of this opportunity to gain information. He also called attention to the fact that tomorrow's session would be largely devoted to the discussion of the subject of peach culture.

"I am informed by the management of the Street Railway, gentlemen," said President Berckmans, "that you are cordially invited to take a car-ride over the city immediately after the adjournment of this session. Every one of you is invited, and they hope to have you all take this ride. You will enjoy it, I am sure."

On motion the Convention then adjourned to be called to order at 8:00 p. m. in the College Chapel on the University Campus.

Immediately after adjournment, the Convention in a body took the electric cars, and rode over the city, as the guests of the Athens Electric Street Railway Company. The ride was very pleasant, as the day had been very warm, and every mem-

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ber of the Convention expressed himself as being thoroughly refreshed by the invigorating air, as well as being delightfully entertained viewing the places of interest in and around this historical, classic city.

EVENING SESSION.

The evening session was called to order promptly at 8 o'clock in the College Chapel, President Berckmans in the chair.

The first paper on the program was "The Relation of Bees to Fruit Growing," by Prof. Wilmon Newell, State Entomologist. The President introduced Prof. Newell, who addressed the Convention as follows:

The Relation of Bees to Fruit Growing.

BY PROF. WILMON NEWELL.

Mr. President and Gentlemen:

The entomologist in his work meets with two immense groups of insects, those which are injurious and those which are beneficial. There is no need of discussing the former class; the various insects which destroy our fruit trees, garden and field crops, and infest stored products of various kinds are examples. As a matter of course, this group has received the most attention. It is but natural that the attention of the farmer or fruit grower should be more forcibly attracted to the death of his trees or crops than to the constant yet quiet and unassuming work of insects which successfully hold in check many injurious species. Nevertheless it is as much the duty of the entomologist to assist in the increase and distribution of beneficial insects as it is to devise means for controlling the injurious ones. As a matter of convenience we may place the beneficial insects in two groups, those which are *indirectly* of benefit to mankind by their parasitic habits upon injurious species, and those which are *directly* beneficial in that they create useful commercial products. The former groups may be illustrated by the various "lady-bird" beetles which destroy myriads of scale insects and plant lice; and by the parasitic *Hymenoptera*—for the most part very minute insects resembling bees or wasps—which live as parasites upon the adults, larvae or even eggs of destructive pests. Of insects directly beneficial we may cite the silk-worm, the cochineal insect and the honey-bee. It is with the latter that we now have to deal. The

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relation of bees to fruit-growing has not received much attention from the average orchardist. I am convinced, however, that it is a subject of much importance, and a discussion of this relationship will, I trust, be of some little interest. It seems to me very essential that we should arrive at a clear understanding of the relationship of these two industries, Horticulture and Apiculture, as they are of mutual benefit to each other.

In this connection I wish to read you a short paragraph, from the address of your illustrious president, Mr. P. J. Berckmans, made before this body at its second annual meeting at Macon, Ga., on August 11 and 12, 1877. This paragraph bears directly upon our present subject and reads as follows:

"Insects are absolutely needed to fertilize the flowers of several of our standard products; they carry the pollen from one flower to another in species where the male and female flowers are distinct; in others whose organs of reproduction are so formed that they require artificial aid in being fertilized, insects are almost the only means to prevent the species from becoming extinct. Our watermelon growers would find their occupation gone if honey bees and other insects were out of existence. Clover seed would have to be brought from Europe if we did not have the bumble bee to fertilize the flowers.

"We must not forget that to the agency of insects we owe most of our wonderful variety of fine peaches, apples, pears and other fruits; it is by insects that in most cases the flowers of our fruit trees are fertilized by the pollen which they carry from one flower to another, and thus numberless fruits of superior value have resulted from this cross-fertilization.

"Insects have been the earliest hybridists on record, and have been the primary cause of the origin of more desirable perfected horticultural products than can be attributed to our own efforts."

It is unnecessary for me to call your attention to the growth of the Georgia fruit industry within recent years; its progress is manifest. The bee-keeping industry in Georgia, on the other hand, is but partially developed and is in the future destined to make material progress.

In parts of the United States the bee-keepers and fruit men have not always lived in harmony and brotherly love. This unpleasant state of affairs has often been brought about by the *erroneous* impression existing among the fruit growers that the bees injured the ripening fruits. On the other hand, the bee-keepers have often suffered serious damage by orchardists spraying fruit trees while in full bloom. It is not my intention to advocate the interests of either party to the detriment of the other, but intsead to carefully consider available facts bearing upon the question. I believe that an impartial consideration will lead us to the conclusion that not only are these two industries perfectly harmless to each other, but that they are mutually beneficial and that every orchardist will find it profitable to himself to become a bee keeper upon a small scale. In order to more clearly set forth the subject I will state it in the form of propositions.

Proposition 1.—*That Insects are Essential for the Pollination of Fruit*

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Bloom, and that the Honey Bee More Thoroughly Accomplishes this end than any Other Insect.

Under this heading I wish first of all to call your attention to the subject of self-sterility in fruits. It is a recognized fact that many varieties of fruits, when planted in large, solid blocks, often fail to set fruit unless other varieties are near at hand. In other words, many varieties are not susceptible of fertilization by their own pollen. The Wild Goose plum is a notable illustration of this, the pollen from the Wild Goose blossom being unable to fertilize any Wild Goose blossom, whether upon the same or another tree. According to Waugh the pollen from Wild Goose is capable, however, of fertilizing the ovules of almost any other variety of plum. Careful studies of self-sterility have been made by Waite, Kerr, Waugh and Fletcher. The latter mentions (Cornell Univ. Bul. No. 181) the Keiffer and Bartlett pears, Winesap and Willowtwig apples, Susquehanna peach and Napoleon cherry as being among the varieties partially or totally self-sterile. Waugh ("Plums and Plum Culture," p. 285) states that all the native varieties of plum, except Robinson, all hybrids (so far as observed) and many of the Japanese varieties, are self-sterile.

Hall, Beach and Booth, in their studies of grapes (N. Y. Exp. Sta. Bul. 223) have found that the Black Eagle, Brighton, Eldorado, Merrimac and Salem are practically self-sterile. They have also shown that pollen from self-sterile varieties of grapes is powerless to fertilize the ovules of either self-sterile or self-fertile varieties.

So far as I am aware, but little investigation has been made with regard to self-sterility in peaches.

It is not my intention to enter into a discussion of self-sterility except so far as the remedy is concerned. The above cited cases are sufficient to emphasize the necessity of cross-pollination, or the transfer of pollen from the blossom of one variety to the blossoms of another variety. The remedy for self-sterility naturally divides itself into two steps. The first of these is the planting of such varieties adjacent as will properly fertilize each other. Waugh, in his book on plum culture, recommends pollenizers for 184 varieties of plums. Having planted the proper varieties and having them of blossoming age, attention should be given to the pollination. For the most part, fruit growers have in the past depended upon this being accomplished without their attention. Hand pollination in orchards is of course entirely impracticable. The wind may to some extent distribute pollen but the most important agency is that of insects. Various wasps, beetles, butterflies and bees visit the blossoms in quest of nectar and carry the grains of pollen from one to another. However, no insect so effectually accomplishes this distribution of the pollen as the honey bee, and by various students this insect is regarded as of more importance in this respect than all others combined. For this reason, the more honey bees there are in the vicinity of the orchard the more thorough will be the pollination. Many fruit growers state positively that the fruit yield has been materially increased after the introduction of several colonies of bees into their orchards.

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Proposition 2.—That Bees Take Part in Disseminating Pear Blight and Brown Rot, but that these Diseases Would be Practically as Prevalent even were there no Honey Bees.

The disease known as blight, or fire-blight, is familiar to all. There are few orchardists who have not witnessed with dismay the sudden death of twigs and limbs on their favorite apple or pear trees. The disease causes the infected twigs to turn a deep brown or black, as if they had been scorched by fire. Its progress is rapid and at times seems to sweep through the orchard or nursery like a veritable conflagration. Fire-blight is caused by a very small germ or microbe, so small as to be invisible except with the aid of a high-power microscope. This germ (Baccillus *amylovorus*) lives and multiplies in the tender, growing tissues of the wood and is found in abundance in the dying twigs. Waite (Yearbook of Dept. of Agr. for 1895, p. 296) has found that this bacillus, while not particularly hardy or resistant, survives the winter in the tissues of the infected twigs and branches at the point of contact of the healthy and dead wood. When the sap rises in the spring gum exudes upon the infected twigs and these masses of gum are found to be teeming with the blight bacillus. Various insects visit these twigs and, sucking up the gummy secretions, take with it thousands of the germs. The insects also visit the opening blossoms in search of nectar and leave therein the germs from the infected twigs. The bacillus can live and multiply in the nectar of the blossoms and hence is carried by the visiting insects from one blossom to another. While bees do assist in spreading the blight, we cannot lay the blame for the malady at their doors, for were they entirely removed a horde of other insects would still continue the dissemination. Among these we may mention various bugs (Hemiptera), wasps, bumble-bees, butterflies, hornets, flies and beetles. Theoretically the removal of all insects from the orchard would prevent the spread of blight, and doubtless such would be the case. Such a removal, however, is utterly impossible and were it accomplished even cross-pollination would be at an end, and the result would be an almost certain failure of the crop in the case of varieties which are partially or totally self-sterile.

Waite (I. c.) has shown that the only logical and practical remedy for blight is to cut out during winter all infected twigs and branches, keeping the pruning knife thoroughly disinfected while doing the work. We must look to this means for controlling and preventing blight, and not to methods put in use after the disease is rampant in the orchard.

We come now to a brief consideration of brown rot, which disease, is likewise, only too familiar to growers of peaches and plums. The rotting of the fruit upon the tree, in transit and upon the market is the cause of an enormous annual loss. The brown, mushy appearance of fruit destroyed by brown rot needs no description. This disease, like blight, is caused by a low form of vegetable life which differs in many respects from the blight germ, and is commonly designated as a "fungous disease." Whereas in the case of blight the introduction of a single germ serves to produce the disease, in the case of brown rot the dissemination

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or spread is by spores or fruiting bodies. These spores correspond in a general way to the seeds of higher plants. Unless these spores be present the familiar brown rotting of fruit cannot take place.

The fact that this disease is most prevalent in damp, rainy seasons has often give the impression that it is *caused* by damp weather. The presence of moisture is essential and favorable to the development of the fungus, and hence damp seasons must be regarded as offering conditions favorable for brown rot, and not as its cause.

For our present purpose we may consider two phases of brown rot, that attacking the blossoms and that attacking the growing fruit, bearing in mind, however, that in both cases the disease is identically the same. Honey bees, as well as other insects, visit the diseased and healthy blossoms indiscriminately and doubtless in this way spread the malady, though so far as we are aware, this has not been definitely proven. Here again, were the bees entirely removed the dissemination would still take place through the agency of other insects.

Where the growing peaches rot while still upon the trees the observer will find many bees busily at work upon the decayed portions, as well as upon over-ripe fruit which has been broken open by too rapid growth or by accident. In this way it is possible for the bees to carry the brown rot spores from decaying fruit to the flesh of other fruit *which is injured or broken open.*

We wish right here to emphasize the fact that the mouthparts of the honey bee are so constructed that the bee *never punctures, bites or lacerates the skin of sound fruit.*

This was demonstrated by experiments conducted by Prof. Riley as early as 1885, (U. S. Ent. Rep. 1885), and again in 1901 by Mr. John Fixter of the Canada Department of Agriculture. (See Report of Entomologist and Botanist in Annual Report on Experimental Farms for 1901, p. 254.) Mr. Fixter exposed to the attacks of bees, sound fruit, sound fruit dipped in honey, and fruit which had the skin cut and punctured. The bees readily toook the juice from the punctured fruit and cleaned off the honey from the dipped fruit. Although the bees were in a starving condition they failed to puncture any of the sound fruit. Hence we see that only after decay has softened the fruit skin or the latter has been injured from other causes can the little honey bee obtain access to the fruit. *The introduction of brown rot into healthy and sound fruit, by the honey bee, is therefore impossible.* He who doubts this statement will find the confirmation in his own orchard, where, if he will observe closely, he will find that the bees do not visit the sound fruit. The same does not hold true of other insects which have powerful biting or piercing mouthparts. It has been shown by Scott and Fiske (Bul. No. 31, Div. Ent. n. ser. pp. 24 to 36), that the Curculio opens the way for the entrance of the brown rot fungus and also that the leaf-footed plant bugs (Coreidae) piercing healthy and diseased fruit alike, are material agents in spreading this disease.

We must therefore conclude, both from observation and from the exper-

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iences of many fruit growers, that the more abundant the honey bees the more thorough will be the cross-pollination in our orchards, and as a result the better will be our crop. We also see that although the bees *do* take part in the dissemination of fire-blight and possibly to a limited extent, brown rot, yet the removal of the bees would not perceptably decrease the prevalence of these diseases. The balance of the account, when all things are considered, is decidedly in favor of our friend the bee. We therefore strongly urge the keeping of bees in or near every orchard—not in the old style "box-hive" or "gum"—but in frame-hives of modern make and pattern, which yield a definite and not inconsiderable profit in the honey produced.

President BERCKMANS: "Gentlemen, Mr. Newell is before you, and if there is any point that he has not sufficiently covered he will be glad to answer any questions you may wish to ask him. He is competent to do so, as is evident from his lecture."

Mr. J. F. HARDIN, Jr.: "I want to bring out the point that Mr. Newell did not bring out, that bees in visiting orchards, if a mixed orchard, will continue to visit one species until a load of pollen is made up. She will not visit a pear tree, then a plum tree and so on, but will continue visiting one species until a load of pollen is made up.

"I want to take exception to the statement that bees spread pear-blight. In the first place bees do not sip the sap of any tree in the early spring. The bees at that time of the year never fly from their hives, and no ordinary inducement, such as the sap from trees, will tempt them to take flight. They will not notice a pear tree until there is nectar in the blossom. When the bee visits the pear tree she does not light on the wood at all, and the only way she could get the bacteria on her would be by a germ attaching itself while she is sipping the flower. Pear-blight will not attack a tree till late in the summer, and the bees have no occasion to visit the tree at that season of the year."

Prof. NEWELL: "Your point is well taken. Whether the bee goes from pear to pear, or from pear to apple, or from peach to apple, I am unable to say. That is one of the problems that remain for some one to determine. Like that gentleman I am loth to believe that the bee scatters blight. Still Government experts, by observation and experiment, claim to have proved

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that this blight germ is in the nectar of the blossom, and that the bee disseminates the germ. I don't think this makes any difference though, for we are bound to have the blight anyhow. If we don't have the bees, we will not have as good a crop. The balance in the account is in favor of the bee. Take the bee away, and you lessen your crop, and it don't make a particle of difference with the blight."

Maj. RYALS: "Did I understand the gentleman to say that there is no remedy for brown rot?"

Prof. NEWELL: "I should have said that it is one of the worst problems that we have to contend with at the present time. I believe Major Ryals is in favor of Bordeaux mixture."

Maj. RYALS: "I have not had altogether as good luck with Bordeaux mixture this year as I have in the past. If it is not a remedy, it's a preventative. As far as the bees are concerned, I don't care about them. If we are not going to have any peaches I don't care to have any honey."

Prof. NEWELL: "I think it would take a better man than I am to give you a remedy for brown rot. I was only trying to bring out the point that the bees did not make any difference as far as brown rot is concerned."

Maj. RYALS: "My idea about brown rot is that it is like any contagious disease, such as scarlet fever or yellow fever. It percolates through the atmosphere. The bees don't carry it there. They may carry some of it. I have not had as good luck with Bordeaux mixture as I have had in the past."

President BERCKMANS: "I take pleasure in introducing to you Mr. E. C. Green, the Assistant Horticulturist of the Texas Agricultural and Mechanical College, who is spending his vacation with us in the interests of the Horticultural Department of the State of Texas. He will speak on the Peach Industry of Texas."

Mr. Green made a very interesting lecture following Mr. Newell and expressed himself as pleased that Mr. Newell had not read his paper, which was evidently done out of sympathy for Mr. Green who had no paper to read. (Laughter).

Mr. Green paid an eloquent and well-deserved tribute to

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the ability and faithfulness of the official State Entomologist of Georgia, Prof. W. M. Scott. He also paid a glowing tribute of praise to the Empire State of the South, which met with vociferous aplause.

After showing by metes and bounds, with the aid of a map, what an immense empire in itself Texas is, he then exhibited by a black boundary inside the State, the peach belt. He said that he gloried in the "red old hills" of Georgia but that Texas had besides red hills, rich valleys between, which raise a bale of cotton to the acre. In fact the soil will raise all crops; corn, wheat, potatoes, all the fruits, and anything except pumpkins. "The only reason we do not raise pumpkins," said he, "is that the vines grow so fast that they wear the pumpkins out dragging them over the ground." (Laughter).

Continuing his address, Mr. Green said:

"It is maintained by certain enthusiastic patriots that Texas is not troubled with the usual diseases and insects of the peach, as infected and infested trees after enjoying the fair days and balmy nights of this blessed land, become immune.

Not long since it was said that they raised nothing in Texas but the four C's; "Cotton, Corn, Cattle, and Colonels." Of course sometimes the boys came in from the range and raised cain and occasionally when it rained the ladies raised umbrellas. But it is now admitted since the Agricultural and Mechanical College, the agricultural papers and the railroads have aided the farmer in diversification, that all crops of the temperate zone can be successfully and profitably grown in the great Lone Star State. This is made possible by the high grade intelligence of the Texas farmer. It is the same intelligence that makes the Texas peach grower the dangerous rival of the Georgia orchardist, for he is fully capable of success with this highly specialized crop. The Texas farmer is an intelligent farmer; he has shortened the horns of the Long Horn steer and lengthened the wool of the sheep; he has made the cows give more milk and the hens lay more eggs; he has made horses run faster, and mules kick higher, and political asses bray louder than ever before.

The Texan is becoming interested in education and at the last meeting of the State Legislature a bill was passed requiring that agriculture be taught in the primary schools and further, an appropriation of $360,000 was made to the A. & M. College and the State Agricultural Experiment Station. The farmer wants education, and the A. & M. College is taking up the work earnestly and vigorously. The railroads help, and at this moment there are six of the chief horticulturists of the State accompanied by Prof. Kyle of the Horticultral Department, in California, studying the methods of the fruit growers and shippers of that State, their trans-

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portation for the entire trip being furnished them by the Southern Pacific Road. These practical men will appear before the Farmers' Institutes throughout Texas next winter and explain the methods of culture and the working of the California Fruit Growers' Marketing Exchange which they are now studying.

The railroads are helping the growers and I am informed by Mr. Wm. Dougherty, a high official of one of the great railroad systems, that the freight rate on a car of fruit from Texas through to New York is exactly the same as that from Georgia to New York. We are on a parity with you in the cost of shipping to Eastern markets. Gentlemen, we are further aided by the Texas Railroad Commission which has the best interests of the State at heart, and which is not a political tool. A few years ago nothing went from the State. A short time after the Commission was appointed a few crates were shipped by express. The Commission has kept up its work and last year there were 1,280 cars of peaches, 1,406 cars of cantaloupes, 1,159 cars of tomatoes and 200 of other early truck shipped to market. In this peach belt (indicating it on the map) during the season of 1901-02 43,600 peach trees were planted and that was along one line of railroad. This year there are already orders placed for 1,600,000 peach trees, chiefly *Elbertas* and *Mamie Ross.*

Large purchases of land in Texas have lately been made by the leading horticulturists of California and the North, who are becoming interested in Texas. Morrill, of Michigan, controls one tract of 12,000 acres, and McNair Bros., of Missouri, are planting 4,000 acres this year.

In brief, one may say concerning the peach growing industry of Texas, that it is surely and rapidly forging to the front. Millions of trees are planted and hundreds of car loads of fruit were shipped this season, notwithstanding the crop was counted a complete failure; still larger orchards are being planted and thousands of cars of fruit may be expected within a few years. Our peaches ripen a week earlier than do the same varieties in Georgia, our railroad tariff to the Eastern markets is on a parity with that of this State, our farmers equal any in intelligence and executive ability, the most noted commercial horticulturists are making large plantings in Texas and our people are developing a Fruit Growers' Exchange that the crops may be handled in the most satisfactory manner. Soil, climate, and all other vital requisites go to make Texas the coming peach kingdom of the United States.

For your kindly and courteous attention, I thank you."

REVISION OF CATALOGUE.

Upon the conclusion of Prof. Green's address, after some desultory discussion the catalogue was taken up for review and revision, the first division being

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APPLES.

Col. WADE: "The Poorhouse Apple has only one star in the Mountain region. I think it would be well to move that up some. I have kept it in my cellar until June, and it's a good keeper as well as having good flavor."

Pres. BERCKMANS: "It has one star for the Mountain region, nothing for the other sections. Col. Wade suggests that we put it down for two stars. Is it your wish to do so?"

There being no objection, it was so ordered.

Pres. BERCKMANS: "It is a pity it had not a better name. It is suggested that we give Kansas Queen two stars for the Middle region. It is marked 'Very showy.' It is desired that we add 'very productive for Middle region.' I hear no objection to these suggestions, and the changes will be made.

Mr. Miller, some time ago you suggested Heslep. What about it?"

Mr. G. H. MILLER: "That is an improved Shockley. It originated in Polk county, just south of us. It has one star, and that's enough, I guess.

On Yellow Transparent, I move we put under remarks 'good for home use and market.'"

This motion was carried.

Mr. R. C. BERCKMANS: "I move that we put 'Red Beitigheimer' on the list for the Middle region as 'promising well.'"

Pres. BERCKMANS: "It is so ordered. What season of the year does it ripen?"

Mr. R. C. BERCKMANS: "Fall."

Col. WADE: "I would like to put on the list the 'Bald Mountain' apple. They originated in North Carolina, and they have been bringing them down through Rabun and Habersham county for the last eight years. They ripen late, and are good keepers. I move that we list 'Bald Mountain' as an early winter apple, 'promising for Mountain region.'"

This was carried.

PEACHES.

Mr. L. A. BERCKMANS: "I notice in the catalogue the Belle of Georgia. I move that the words 'of Georgia' be stricken, and the name of this peach be simply Belle."

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This motion was carried.

A MEMBER: "I move that Brandywine be marked 'for home market."

This motion was carried.

Mr. G. H. MILLER: "I move that Carman be given two stars for the Mountain region."

Carried.

Mr. G. H. MILLER: "I also move that we have one star for the Mountain region and one for the Middle region for Alexander. "

Maj. GLESSNER: "I move that one star be taken for each one of the regions from Alexander."

Carried.

Mr. G. H. MILLER: "I notice that the Crawford Early and Crawford Late each have two stars for the Mountain region. I move that they both be reduced to one star."

Mr. R. C. BERCKMANS: "I move that they also be so reduced for the Middle region."

These changes were ordered.

Mr. L. A. BERCKMANS: "I move that Columbia be reduced to one star for both Middle and Mountain regions, and the remarks be eliminated."

It was so ordered.

Maj. GLESSNER: "I move that Sneed be reduced to one star for the Middle region."

Carried.

Mr. L. A. BERCKMANS: "I move that Mamie Ross be given one star for the Middle region, and under remarks 'promising market variety.' "

Carried.

Prof GREEN: "In Texas we consider that one of our best varieties."

A MEMBER: "I move that Newington Cling be reduced to one star in the Mountain region."

Carried.

Mr. R. C. BERCKMANS: "I move that under Stinson's October these remarks be added: 'good late market variety.' "

Carried.

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Mr. L. A. BERCKMANS: "I move we strike Triumph from the list."

Carried.

Mr. G. H. MILLER: "I move that Waddell be given two stars for the Mountain region."

Carried.

Maj GLESSNER: "Does anybody know anything about the 'Slappey' peach? I have heard of it."

Pres. BERCKMANS: "That is that peach from Marshallville, is it not?"

Prof. SCOTT: "Yes, sir."

Pres. BERCKMANS: "Shakespeare says 'What's in a name?' I think there would be a good deal in it in this instance, for every fruit dealer in New York would call this peach 'Sloppy'!"

Prof. SCOTT: "This variety was originated at Marshallville, by a man by the name of Slappey. Nothing can be said of it at this time except, perhaps, that it is promising. I know of one orchard of these peaches planted by Mr. Eugene Rumph. It is said to be a shy bearer. In connection with this I would like to hear from Major Jones."

Maj. JONES: "Its bearing qualities are not fully established. Some are satisfied with it, while others are hardly satisfied. At its home in Marshallville they have not yet been able to determine whether it will make a desirable crop or not."

Pres. BERCKMANS:: "I don't like its name at all."

Prof. SCOTT: "It is now grown under three different names: 'Slappey,' 'Roberta,' and 'Hellbumper.'"

Pres. BERCKMANS: "That last name is worse than the other."

A MEMBER: "I move we leave it off the list for the present.

Carried.

Although only two divisions of the catalogue had been discussed, on motion the evening session adjourned to be called to order at 9:00 a. m., in the Opera House, Tuesday, August 4, 1903.

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SECOND DAY—MORNING SESSION.

The morning session, August 4, 1903, was called to order at 9 a. m., by the President, Mr. P. J. Berckmans.

The exercises were opened with prayer by Rev. W. D. Hammock.

The first paper was read by Col. John P. Fort, of Mount Airy, Ga., on "The Relation of Insectivorous Birds to Fruit-Growing." Col. Fort was not present at the previous day's session, so his paper was placed first on the morning program.

The Relation of Insectivorous Birds to Fruit Growing.

BY COL. JOHN P. FORT.

Mr. President and Gentlemen:

I have been requested to read to the Georgia State Horticultural Society a paper upon the subject of Relation of Insectivorous Birds to Fruit Growing.

It will not be within the scope of this paper to enter into details of a subject upon which so much might be written. But it will be my intention to present in a general manner from information and observation the vital importance of the matter under consideration.

Where food supply is abundant the increase of insect life presents one of the marvels in nature that always strikes the observer with wonder and astonishment.

The Entomologist views with alarm the new species of noxious insects appearing upon the earth. To give an illustration in different departments of human endeavor:

The devastation of the vegetation of a portion of the State of Massachusetts by the Gypsy Moth, causing the State to appropriate the large sum of six hundred thousand dollars for its destruction. The attack upon the Irish potato by the Colorado Beetle, upon the orchard by the San Jose Scale. Upon the cotton plant by the Cotton Boll Weevils. These present to us very forcibly the destructive power of noxious insects.

I have seen large areas of the cotton crop of Georgia destroyed in two or three days by the Cotton Caterpillar. I have seen a peach orchard in the lower section of this State for which four thousand dollars was offered rendered valueless in a month from the attack of the San Jose Scale. I have knowledge of an orchard of peaches for which nine thousand dollars was refused, rendered valueless by the attack of the Curculio.

The United States Department of Agriculture estimates an annual loss to the agriculturists and horticulturists of the United States from noxious insects at about three hundred millions of dollars.

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A short time since it was stated by an eminent French savant who had given much thought to the subject, that if all the insectivorous birds were destroyed in nine years the earth would be rendered uninhabitable to the human race. If it be true that the agency of birds is so necessary for man's existence upon this planet, we may well ask the question:

First. How many insectivorous birds have we with us? and how many noxious insects do they destroy? Next. Are they maintaining their numbers? And if they are not, what are we doing to protect them? Is this great equilibrium between man and the higher animals and insect life being maintained?

During the early part of the last century Alexander Wilson, the great ornithologist, estimated that two million of insectivorous birds nested and lived during a portion of the year in a single county of Pennsylvania. This estimate was made by actual count of given areas and this conclusion was reached after careful study. From this estimate we may conceive of the innumerable hosts of insectivorous birds that inhabit our country.

The next question that we may ask is, What do these birds eat? How much do they require to support them? What is the character of the insects they destroy?

We will answer the last question first by saying except forms too minute for food, all species of noxious insects are devoured by certain classes of birds. What I mean by noxious insects are those injurious to mankind, and their name is legion. As a rule the more destructive the insect, with more avidity it is sought by certain birds. As to what and how much they eat, I beg leave to present a few facts taken only from the highest authority and personal observation.

The Year Book of the United States Department of Agriculture for 1900 states: "In the examination of the stomachs of two Golden Winged Woodpeckers—a bird known among us the Flicker and Yellow Hammer—that each stomach contained more than three thousand ants, and in a third were five thousand of a very minute species. In the stomach of one Cuckoo (a bird known among us as the rain crow) examined, was found 250 tent caterpillars. In another 217 heads of the fall webworm. The Titmouse, known as Tom-Tit and Chickadee, lives during the winter season almost exclusively upon the eggs and pupa of noxious insects and forms of insect life so minute as to escape the observation of man.

When we observe one of our small insectivorous birds such as a Titmouse, Greenlet, Kinglet, Warbler, Nuthatch, Creeper, etc., gliding from bough to bough of some tree, at each decided motion of its beak it is destroying the egg, pupa, larva or some minute form of insect injurious to vegetation. The amount that each destroys daily approaches the hundreds and often the thousands."

An extract from the Year Book of 1900 is as follows:

"In the month of May, 1900, when the apple trees had just expanded, rosettes of small leaves and flower buds, a multitude of warblers of several species were seen going through an orchard examining these rosettes and picking something from each. An investigation of the trees not yet reached

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by the warblers showed that each rosette contained from one to a dozen large plant lice, while similar investigation of the trees explored by the birds revealed but few of these insects."

It is when the young are in the nests that the greatest destruction of insects occur. The young of insectivorous birds represent small mills, as it were, to grind noxious insect life. To illustrate this I give one extract from the U. S. Dept. of Agr. Year Book of 1902, page 216:

"Robert Kennicott, a most careful observer, ascertained that a single pair of house wrens carried to their young about one thousand insects per day. At this rate a young brood of wrens probably destroy before leaving their nest as many as ten thousand insects. According to the usual proportion in the food of young wrens about six thousand of these are insects that devastate crops, including nearly six hundred cut worms."

I have made similar observations from watching the Oriole, Great Crested Flycatcher and common Blue Bird feed their young.

I estimated from observation and actual count that a pair of blue birds would bring to their young an insect or a mass of insects in the form of a pellet every eight minutes for twelve hours during the day.

Different species of insects are consumed by special classes of birds. When the young are small they are fed upon soft-bodied insects or masses of eggs or larvae in the form of a pellet, thus increasing the number destroyed.

Last fall when the American Swift, known as the Chimney Swallow, was assembling in great numbers to roost in a chimney of a house on Milledge avenue, of this city, preparing for their migration to the tropics, some of the neighborhood boys threw stones at them as they descended into the chimney and some of them were killed. The boys desisted from killing them upon my request. I took one of the birds just killed and assembling my children, cut open a bird to show them what was in the stomach of this most useful of birds.

There was a gelatanous mass of insects in its stomach that I estimated at more than five hundred. These insects were of the order Diptera, represented by the Midge, Gnat, Mosquito and other blood-sucking species. How foolish to destroy a bird who seems to be placed by nature in the air to clean it from pests and thus make the earth habitable for mankind and other animals. From the life and energetic power displayed by this small bird I conceive that its daily destructive capacity excels that of any other insectivorous bird.

I have thought it necessary to bring forward the foregoing illustrations before entering upon my subject. In the language of Brother John Bunyan, having detained you in the porch we will now enter into the vestibule of the matter given me for consideration.

The apple is entitled to be placed in front as the most important of all fruits of the temperate zone.

The insect that attacks and destroys the apple above all others combined is the Codling Moth. The annual loss to the apple growers caused by this insect in the United States amounts to millions of dollars. It is a scourge and terror to the apple grower.

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The adult insect is a small brown moth of the species Lepidoptera. It lays its egg upon the tender green apple as soon as the blossom falls. On the egg being hatched the young larva eats into the green apple where it exists, causing the apple to fall before it is mature.

To keep this insect in check is of prime importance and absolutely essential to successful apple growing in Georgia.

As with nearly all noxious insects it is the first brood unchecked that causes the crop to be overwhelmed. Destroying the parent insect before it has deposited its egg is an object of great importance. This insect in all its stages is agreeable food to insectivorous birds. It is a true miller and is very often around a light at night, where it has obtained the name together with other similar species of candle fly. Its habit of flying at dusk and after nightfall in a great measure protects it. Being a soft-bodied moth it is a favorite food for all the Flycatchers. The various Peewees, the Crested and Tyrant Flycatcher feed upon it as it flies in the air from sundown until dark. At this time it falls a prey to the Night Hawk, Whippoorwill and Chuck-wills-widow.

The class of birds known as the Goatsuckers are prime factors in keeping such night-flying insects in check and that they should be destroyed by man is a very shame.

The ordinary bat, "that we will denominate a bird for this purpose," is of incalculable service in keeping in check this as well as other night-flying noxious insects.

The larva of this insect while in the green fruit is protected, but when spinning a thread to descend to the earth it is destroyed in great numbers by the Warblers, Titmice, Vireos, Greenlets, Kinglets and other small insectivorous birds.

The borer, apple curculio and flea beetle may be classed as the next great enemies to successful apple growing. These insects are of the order Coleoptera or sheath-cased insects. They are destroyed by the larger Flycatchers. The soft part of the insect is digested and the hard portion ejected. I have observed the Tyrant Flycatcher eject small pellets of the wings and hard portions of such Coleoptera some time after they had been swallowed. The larvae of these insects are sought for and eaten by the Woodpecker. In some sections the canker worm and tent caterpillar do great injury to apple trees. The parent moths of these insects are destroyed by all classes of our Flycatchers; the larvae of the canker worm by the Thrush family and Woodpeckers. The body of the tent caterpillar is protected by a coat of spines from the attack of most birds but it seems to be the special prey of the Cuckoo, whose gizzard seems formed to consume such insects. As an enemy and pest to the peach, plum and cherry the curculio stands forth pre-eminent.

This insect is a small dark greyish brown beetle of the order Coleoptera. All insects that have the power of flight use their wings soon after they burst their pupa cases and emerge from their chrysalis form. This flight seems to be for the purpose of organizing its system for reproduction. The male often meets the female in the air. The gravid female often flies high

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in the air before alighting to deposit her eggs. It is in the early spring when the plum and peach first put forth their leaves in the month of March when this little beetle emerges from its winter hibernation. Can we prepare a bird to meet this insect in their hymeneal flights who with one snap of his bill would destory a colony in empryo? I would suggest a bird for this purpose. Our Purple Martin.

The Martin arrives from the tropics early in March in this State to meet the curculio in his first flight in the beginning of spring. I ask your indulgence for personal illustrations. I furnish homes and nesting places for the Martin around my orchard as a necessary part of my business. The home is a simple one. An ordinary calabash with a hole cut in it, tied with an oiled leather string to a pole upon which there is a cross beam. This pole is about twenty-five feet tall. A large number are nesting around my peach and cherry orchards at this time. Toward the middle of this month about the harvest moon they wing their flight to their tropic home.

The curculio is a slow flyer and is caught also by the Blue Bird, for whom nesting places should be provided in and near every orchard. I would estimate that at least thirty or more pairs of Blue Birds have reared from one to two broods of young this season in my orchard. Nests for other insectivorous birds should be prepared to induce them to occupy them.

In the larva and pupa stage the curculio is protected in a great measure from birds by reason of his situation in the peach or in the form of a chrysalis in the earth. This immunity, like that of the codling moth, is the main cause of its continued and uninterrupted increase with us. There is no anticipation of the utter destruction of any species of insects by birds, but by their use the damage by insect life may be brought to a minimum.

We will consider next the peach root borer. This insect attacks the root and base of the trunk of both the peach and cherry. The perfect insect of the peach root borer is a blue moth of the order Lepidoptera. It has the appearance of a wasp but on examination is found to be a soft-bodied moth and agreeable food to those classes of birds known as Flycatchers, Martins, Swallows and Goatsuckers. It is exceedingly active in its flight and its resemblance to a class of the Hymenoptera may in some measure protect it. But the microscopic eye of the bird enables it to detect its food where the eye of man would be of no avail. My observation of birds procuring their food by their hearing and vision might cause me to relate incidents that my hearers might consider bordering on the marvellous. We will not enter into these interesting inquiries fearing that they will lead us from the subject before us.

Upon one occasion I observed a Golden Winged Woodpecker obtaining the larva of the peach root borer from the base of the trunk of a peach tree. It had visited a few other trees in the immediate vicinity. I failed to find any worms at the root of the peach tree after a visit from this bird. This interesting bird is the only Woodpecker that is partly terrestrial. Its bill has a curve similar to that of a Thrush, indicating a power and inclination to dig in the earth. These beautiful and useful birds are so

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often shot by man that they avoid the orchard for the secluded woods. If rendered gentle by kindness a few birds of this species would do incalculable benefit in a very short time in peach orchards that are all more or less damaged by the peach root borer.

This bird is often called the Flicker and Yellow Hammer, but its true name is the Golden Winged Woodpecker.

The Thrush family are especially adapted for destroying this insect in its larval state after the earth is softened by rain. I mean by the Thrush family birds known under the name of Thrasher, Catbird, Mockingbird, Ovenbird, Woodthrush, Wagtail, etc. While I have never seen the Thrush at the interesting occupation of destroying this worm, I have known the Catbird to follow a workman who was taking this worm from the tree, so as to consume them as they were left near the tree. In very wet weather the borer comes very near the surface, where I have but little doubt but that it is consumed to some extent by the common Blue Bird.

While the San Jose Scale is a very minute insect, I would think in its larval state it would be observed by the microscopic eye and destroyed by our smallest Vireos and Humming Birds.

The demand for the skins and feathers of classes of our useful insectivorous birds for ornamental purposes, together with their destruction in breeding seasons, have caused their decrease in the last two decades to an alarming extent.

Fair estimates by competent persons have placed the wanton destruction of useful birds for such purposes in the United States at thirty-five million per annum. To illustrate by figures taken from the annual auction feather sales of our largest cities strikes me with horror. At one auction sale the skins of 38,198 Scarlet Tanagers, 38,198 Humming Birds, 48,759 Jays and Kingfishers, etc. The annual destruction of these useful and beautiful birds entails an annual loss to those who cultivate the earth not only of millions but of many millions of dollars.

The late passage of the Act known as the Audubon Bird Bill by our Legislature is a move of great importance and if practically carried out its use can hardly be overestimated.

I hesitate to write at more length. Each and all of us should protect our birds from destruction. Present the importance of this matter to the generation entering upon the stage of life. Teach them to love the birds. To admire their plumage and song. To study their habits and contemplate the works of a munificent Creator who has so wonderfully fashioned these beautiful inhabitants of the air.

President BERCKMANS: "Gentlemen, Col. Fort is before us, and, as has been the custom, he will be pleased to give information to anyone on this or kindred subjects upon being asked questions. I regard this as one of the most important papers that can come before the Horticultural Society, and we have all

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no doubt heard it with the appreciation that is due to it. Col. Fort will be glad to answer your questions."

Prof. STARNES: "I am very glad, Mr. President, that you have stressed the importance of this topic, and I am only going to consume a few short minutes of the time of the Convention. At the instance of Mr. Dutcher, of New York, the Chairman of the Protection Committee of the American Ornithologists' Union, I hope today to organize from our number a branch of the Audubon Society, that is covering the Union, State by State, ours being one of the few left having no branch of this organization. It will not take five minutes to organize it, as I know all of us are in full sympathy with the movement, and what we want now is some recognized medium through which we may give inmmediate and emphatic expression to our views in definite and tangible form. I shall ask the indulgence of the Chair for three or four minutes to take down the names of those who are willing to unite under the direction of Chairman Dutcher in this work. I have been offered the earnest cooperation of many prominent citizens of the State, and the ladies are particularly enthusiastic in pushing the matter. Among the ladies who have promised their active assistance are Mrs. Julius L. Brown of Atlanta, and Mrs. B. W. Hunt of Eatonton. Dr. Eugene Edmund Murphey of Augusta, was to have participated in the launching of the Society here today, but was unexpectedly prevented at the last moment—and by the way—no worthier selection could be made for President of the new chapter than Dr. Murphey, who has the matter very much at heart.

In conclusion, Mr. President, I suggest that to save time it will be best not to interrupt the proceedings of the Society for the purpose of organizing the new Audubon Chapter, since I can, with your permission, while the discussion proceeds, circulate quietly among the members and enroll their names."

The Chair stated that it would not be necessary to stop the proceedings of the Convention, and gave Prof. Starnes permission (as requested) to circulate among the delegates present to procure the names, while the program was continued.

(Over 50 names were subsequently enrolled by Prof. Starnes.)

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Col. WADE: "I congratulate Prof. Starnes upon his remarks, and I think that proper legislation should be procured for the protection everywhere of insectivorous birds, which are a benefit to horticulture.

I would like to ask Col. Fort especially about the lark. I consider it head and shoulders above all our insectivorous birds. Col. Fort, is not the lark the best insectivorous bird we we have? I think it's a shame that it is not on the protected list, and that silly boys are allowed to kill them."

Maj. RYALS: "Do I understand that we are not to shoot any more field larks?" (Laughter.) "Why the pesky little beasts pull up my young corn like all-forty every year! And yet you want to protect 'em?"

Prof. STARNES: "For every cent of damage those larks do you, Maj. Ryals, by pulling up your corn, they benefit you a dollar through the insects they also destroy. The injury to the corn is incidental and a trifle; their extermination of insect life outweighs such damage a hundred fold!"

Col. FORT: "True; and in answer to the question asked me about the lark, will say that I know full well the prejudice against it, and the reason the Legislature was opposed to putting it on the protected list. In the spring of the year the lark pulls up corn that is just coming up. I have been interested in agriculture a great many years, and I have employed boys to go out and frighten these larks away. The dove also pulls up corn. The damage they do in pulling up corn, however, is overcome a thousand-fold—much less a hundred fold—by the good work the lark does in destroying cut-worms, and insects dangerous and inimical to the interests of the agriculturist. It is only for three or four days that the corn is in danger. I have, as a boy, killed larks, martins, swallows, and whippoorwills. I have lived long enough now to know the injury that I was doing. I think myself that the lark should be protected. If you can get this bill passed by the Legislature in the future, I think it would be a good thing to protect the lark, but I would not take up the cudgel for it until the balance of this bill is passed. As for the dove, it is not insectivorous, but a gramnivorous bird, and is of untold value in its destruction of weed-seed."

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Mr. DECKNER: "I want to know what you are going to do with the house-sparrow—the English sparrow?"

Col. FORT: "I am here to answer questions, and I shall be pleased to answer that one as well as I can. That bird is not protected by the Audubon bill. He might be termed an Ishmaelite, so to speak. I have observed these birds feeding their young. In the spring of the year they feed them upon soft-bodied insects and plant-lice. My wife had a few rows of sweet peas one spring, and they were covered with lice, and the English sparrows entirely destroyed them. There is some prejudice against them, but their destruction of insects in the spring is simply enormous."

Mr. DECKNER: "I had a cabbage patch entirely relieved of the cabbage worm by English sparrows. For the truck farmer I should say the sparrow is a useful bird for cleaning off insects. I had an English pea crop about to be ruined once, and the sparrows cleaned it off, so that I made a full crop."

Col. FORT: "The English sparrow is useful in his place and season. I am sure of that, although he is not protected under this Audubon bill."

Mr. BROWN: "On account of a conversation with Col. Fort some time ago I was made a great believer in martins, and since that time I have been diligently erecting martin poles. I have had very little success, however, in inducing martins to inhabit the gourds. I am thoroughly satisfied that they would be a benefit. I would like to ask Col. Fort if there is any way to induce the martins to inhabit the gourds?"

Col. FORT: "You may have neglected some little detail in regard to the matter. In the first place, the martin builds its nest of clay and straw. You must, in putting up the gourds, have a small hole in the bottom of each gourd so that it will have drainage. Then make the gourd permanently fast to the pole, and elevate it high enough, so that the martin can inhabit it without being frightened. I have succeeded in inducing them to come around my orchard, and I think I raised not less than 50 young martins this year. The gourd must be sufficiently large—and you must have an inviting home for him to live in. The gourd should be large enough to hold not less than half a gallon. If you once get the martins to take up

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with you, they will come back to the same place the next year, when they return from the tropics, which is usually about the 2d of March."

Pres. BERCKMANS: "The next paper in order is one by Prof. S. H. Fulton, of the United States Department of Agriculture, on "Export and Cold Storage Work with Peaches." I take pleasure in introducing to you Mr. Fulton."

Prof. Fulton then addressed the Convention as follows:

Cold Storage and Export Work With Peaches.

BY PROF. S. H. FULTON.

The extensive and rapidly increasing production of the peach throughout all parts of the country where climatic conditions and transportation facilities are favorable for its growth, is a factor of the fruit growing industry, which is making itself felt in the work of shaping the government cold storage and export investigations.

The growing of large quantities of a few strictly commercial varieties, among which the Elberta stands paramount, suggests the desirability of tiding over periods of temporarily overstocked markets by cold storage methods; while in a full crop year, the immense production of all varieties in the aggregate indicates the need of broader markets. Both the cold storage and exporting of peaches present numerous problems which during the past two years have received attention through the Pomological Investigations of the Bureau of Plant Industry.

A year ago Elberta peaches for cold storage anl export were obtained in this State by the Department of Agriculture from the Hale Orchard Company, of Fort Valley, and later in the season from Mr. J. H. Hale, South Glastonbury, Conn. Several other varieties were also secured from Mr. Hale's Connecticut orchards for cold storage. Still later in the season an export shipment of Salway, Levy Late and Sunrise was made in co-operation with the Allegheny Orchard Company of Paw Paw and Keyser, W. Va.

During the peach season just closed in Georgia, only one export shipment was made. This shipment consisted of 100 carriers of Thurber, furnished by the Hale Orchard Company. A series of shipments of Elberta and other varieties were planned but abandoned, with the above exception, on account of unfavorable weather conditions, which badly injured the carrying quality of the fruit. One shipment of Stump in carriers and boxes was packed at Fort Valley for export but upon arrival in New York the fruit showed signs of decay and was sold. A week later 102 carriers of Elbertas were wrapped and packed in the orchards of W. R. Turner, of Marietta, with a view to exporting. This lot was seriously delayed in transit and reached New York too late to be placed on board the ship.

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The fruit in this shipment had not been so much injured by wet weather as that from South Georgia, and would probably have withstood the ocean voyage had the fruit train arrived in time for the transfer to be

COLD STORAGE INVESTIGATIONS.

For cold storage investigations the fruit has been divided into two lots, one highly colored, fully mature but firm, the other nearly full grown, well colored, hard fruit. Part of the fruit has been shipped to storage with the least delay possible, while part has been delayed in the packing house from ten to twenty-four hours, before being shipped. In Connecticut one-half of the fruit was wrapped in California fruit paper. Part of the Georgia fruit this season was wrapped in unprinted newspaper. The Connecticut half bushel basket, the Georgia six basket carrier and the flat 20 pound box have been tested in their respective relationship to the keeping of peaches in storage. Duplicate lots of all the series were stored in temperatures of 32 degrees, 36 degrees and 40 degrees.

The Georgia fruit for storage was shipped last year in refrigerator cars to the Cold Storage Department of the Reading Terminal Market in Philadelphia; this year to the Merchants Refrigerating Co., of Jersey City.

The Connecticut peaches were stored with the Hartford Cold Storage Co., of Hartford.

The outcome of the cold storage experiments with both Georgia and Connecticut peaches is quite similar. Firm, highly colored fruit kept in prime commercial condition from two to three weeks in a temperature of 32 degrees. The quality of the peaches was retained and the fruit stood up well for from two to three days after removal from the storage house. After three weeks the quality deteriorated rapidly, although in the case of some varieties the fruit remained firm and normal in color and appearance from four to five weeks. Fruit which was mellow when stored deteriorated much more quickly in the storage house and after removal. Unripe fruit was inclined to shrivel.

In temperatures higher than 32 degrees the life of the fruit was considerably shortened. In 36 degrees the fruit began to discolor at the end of two weeks, while in 40 degrees it ripened up quite rapidly and reached its commercial limit in less than ten days. In this connection it may be stated that molds and rots which tend to hasten the breaking down of fruit in cold storage are much more active in the higher than in the lower temperatures.

The effect of delay in storing the fruit is quite striking. This season Elbertas from Fort Valley, delayed 24 hours in the packing shed before shipping, showed 47 per cent. of decay after eight days in cold storage in Jersey City, while the same variety picked at the same time but placed in a refrigerator car very soon after picking and shipped the same day, showed only 13 per cent. of decay after an equal number of days in storage.

Results clearly indicate that the fruit should be carefully graded and firmly packed to prevent bruising in transit. In less than a week bruised

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areas discolor in the storage house and render the fruit unattractive. The wrapper proves a great protection in this respect. It also aids in preserving the firmness and brightness of the peach.

The fruit kept slightly better in the 20-lb. box than in any other package used. This is explained by the fact that in this package the fruit is well protected from air circulation. In baskets and carriers some wilting was observed at the end of two weeks.

The peach absorbs odors readily and will quickly become tainted if celery, cantaloupes or other vegetables or fruits, which impart strong odors are stored in the same room. The importance of storing in clean rooms, used only for peaches, or other warehouse commodities which will not contaminate the air, cannot be overestimated.

Fruit should be removed from cold storage while it is still firm and sound. If allowed to reach its limit in storage, it breaks down very quickly after withdrawal and may become worthless before it reaches the consumer.

The difficulties in peach storage are numerous, in fact so much so that few houses attempt to store this fruit. It not infrequently happens that before the fruit is taken from the storage house, the flesh turns brown in color, while the skin remains bright and normal. If the flesh remains normal in color and texture in the storage house, it may discolor within a day or two after withdrawal. Delicate flavor and aroma may give way to insipid and bitter taste in fruit kept for a considerable length of time. In seasons like the past, when brown rot is prevalent, this fungus continues its work of destruction in the storage house. Cold temperatures retard but do not prevent its spread.

With favorable weather conditions, however, and the exercising of due care in picking, packing and shipping, these troubles may be very largely overcome and the firm fleshed varieties held in good condition for from two to three weeks. In the softer varieties the ripening process goes on faster and the fruit breaks down more quickly.

Probably the greatest good to the peach industry to be hoped for from cold storage will lie in the temporary storage of fruit during an overstocked market. Some seasons it may also be useful in filling the gaps between different sections, when local failures prevent a continuous supply. Again in some sections it may be found profitable to briefly prolong the season of certain varieties to take the place of later ripening kinds, which come at a good season but are unprofitable because of unproductiveness, lack of vigor of tree or for other reasons.

EXPORT SHIPMENT.

In the export shipment work a number of problems have been under consideration. First, and all important, was the question as to whether or not peaches grown throughout the Eastern and Southern States could be successfully transported to European markets. The arrival of the first shipments in London in bright, sound condition was conclusive evidence that the successful exporting of peaches was not impossible, and the ques-

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tion of varieties, packages and methods of handing the fruit for export was at once taken up. Elberta, Thurber, Levy Late, Salway and Sunrise have been tried in carriers, and in the case of the Elberta, both the carrier and the twenty pound box have been used. The effect of the wrapper has also been under consideration.

The first shipment of peaches in 1902 consisted of 50 carriers of Elberta, which were forwarded from the Hale orchards at Fort Valley, July 19. This lot was about equally divided between "Fancy" and "Extra Fancy" grades packed for the New York market. A shipment of wrapped fruit packed for export, which was in the same car, did not reach the ship owing to late arrival of the fruit train in Jersey City. When the car was opened the first 50 carriers accessible were transferred to the American Line steamer St. Louis. These being from the upper tiers in the car, the fruit was probably in poorer condition to withstand the long voyage than the average of the same car load. However, the consignees reported that with the exception of four carriers, that had frozen through nearness to the refrigerator pipes, the fruit was in good order. The fruit was sold August 1, twelve days after picking, for an average price of $2.09 per carrier, gross. The total cost of transporting from New York to London and selling amounted to 81 cents per carrier, leaving a net at New York of $1,29.

The second shipment, also from Mr. Hale's place, left New York in an Atlantic Transport Line steamer, sailing July 26. This shipment consisted of 100 carriers of unwrapped "Fancy" and "Extra Fancy" Elberta, packed for the New York market. The "Extra Fancy" grade netted $2.02 per carrier at New York; the "Fancy" grade $1.60. This shipment was reported on as arriving in good condition and the outlook for business in this line as promising well in the future.

The third shipment, which left New York on an Atlantic Transport steamer, August 2, consisted of 50 carriers "Fancy" Elbertas, wrapped. This fruit was shipped from Vort Falley, July 23. It arrived in New York July 27, and was placed in cold storage until August 1, then transferred by wagon to the steamer's refrigerator. August 13, twenty-one days from the orchard, the fruit was sold in London for $3.10 per carrier gross, netting in New York $2.36.

The details of these shipments are here given:

GEORGIA EXPORT PEACH SHIPMENTS, 1902.—FROM FORT VALLEY, GA., TO LONDON.

1. First shipment per SS St. Louis, from New York, Wednesday, July 23. Sold August 1, 1902.

2. Second shipment per SS Minnetonka, from New York, Saturday, July 26. Sold August 7, 1902.

3. Third shipment per SS Minnehaha, from New York, Saturday, August 1. Sold August 13, 1902.

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Variety	Grade	Quantity	Style	London Price	Export Chgs.	Commissions	Total Chgs.	New York Net	New York Value
1. ELBERTA	Fancy and Extra Fancy	50 Carriers	Unwrpd.	$2.097	.635	.104	.81	$1.29	$1.86
2. ELBERTA	Fancy	51 Carriers	Unwrpd.	2.46	.673	.123	.861	1.60	.....
	Extra Fancy	49 Carriers	Unwrpd.	2.91	.673	.145	.883	2.02	1.86
3. ELBERTA	Fancy	50 Carriers	Wrpd.	3.10	.507	.155	.741	2.36	1.86

In September two commercial shipments of Elbertas were made, also through Mr. Hale's co-operation, using fruit from one of his South Glastonbury orchards.

The first Connecticut shipment consisted of 200 carriers of "No. 1" Elbertas. This shipment left New York, September 13. The fruit was reported by the consignees as in excellent condition on arrival. It was sold September 24. Of this shipment 187 cariers were wrapped, while the remaining 13 were unwrapped. The wrapped fruit sold at an average of $2.57 gross, netting $1.86 at South Glastonbury. The unwrapped fruit averaged $2.23 gross and $1.54 at South Glastonbury. Unwrapped fruit of the same grade sold in New York on both shipping dates at $1.75 per carrier, indicating that on such a year as last the carrier on the New York market would net higher for this class of Connecticut fruit than could be realized on London shipments.

In the next shipment, which left New York September 20, thirty 20-lb. boxes were included in addition to 200 cariers. The fruit in boxes averaged $1.52 gross in London and $1.10 net at South Glastonbury. As the box contains little more than half the quantity of fruit required for the carrier, the net result was about 45 per cent. greater than on an equal quantity in the carrier, which netted in this shipment $1.51 for wrapped fruit. The consignees in reporting upon this shipment expressed a preference for smaller packages, such as the 20-lb. box.

The last shipment of the season was made in co-operation with the Allegheny Orchard Company, of Paw Paw and Keyser, W. Va. This consisted of 25 carriers of wrapped Salway, Levy Late and Sunrise. It went by express to New York and was transferred to an Atlantic Transport Line steamer, sailing October 4. The Salway netted in New York $1.61 per carrier, Levy Late $1.54 and Sunrise $1.50. For all these varieties the New York net returns were less than the New York values of similar unwrapped fruit on day of shipment, the home value being $1.70 per carrier.

Sunrise, which is a clingstone of the Heath cling type, was reported upon

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unfavorably by the consignees. Evidently clingstones are not desired by the English consumer.

The excessive rains in Georgia this season swelled nearly all varieties of peaches to an abnormally large size, and the watery texture of the fruit made it easily susceptible to the attack of brown rot. Georgia varieties of peaches, which last year would have carried to London in excellent condition, this season barely withstood transportation to New York.

The shipment of 110 carriers of Thurber before alluded to was made from the Hale orchards after 10 days of comparatively dry weather. Immediately after this shipment was made the rains again set in and all future export shipments from Fort Valley, as planned for this season, had to be abandoned.

Of the Thurber shipment 101 carriers were wrapped and 9 were unwrapped. The wrapper used was unprinted newspaper, 7 1-2 by 11 inches, costing 20 cents per thousand wraps. The cost of wrapping and packing, including paper and labor, was less than 10 cents per carrier.

The fruit netted at New York $1.49 per carrier for wrapped and $1.08 for unwrapped stock. The consignees, in reporting upon the shipment, stated that the fruit had been chilled in steamship refrigeration. It is possible, however, that such deterioration as may have taken place on shipboard was due to a lack of best carrying quality of the fruit this season rather than to a temperature too low for the safe transportating of peaches.

The log of the steamship refrigerating engineer showed no temperature lower than 32 1-2 degrees during the voyage, while the average temperature of the fruit compartment was from 33 to 34 degrees. As already pointed out, our experiments have shown that a temperature of 32 degrees is not only safe for peaches, but highly conducive to long, sound keeping of the fruit.

The results of these export investigations show that peaches from Georgia, West Virginia, Connecticut and other Eastern States, may be placed on the London market in sound commercial condition, providing the weather is favorable for the normal development and ripening of the fruit. To export peaches successfully, careful attention must be given to all the details of picking, packing and shipping. Peaches for export should be well colored freestones, uniform in size and shape. The fruit should be picked a little harder than for the New York market, and it should be carefully wrapped and packed.

As an export package for peaches the twenty pound box is more promising than the carrier. The latter package is too bulky and rather too frail. The box being smaller, more nearly meets the approval of the English fruit handler who is accustomed to buying peaches from France and other European countries in small packages. The box is easily packed and affords excellent protection to the fruit. It occupies half the space and contains a little more than half as much fruit as the carrier.

In car load lots the cost of ocean freight and refrigeration does not exceed fifty cents per six basket carrier. In view of relatively low cost for ocean service, the development of an export trade in peaches from the

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Eastern States may be predicted. The importance of such an outlet may be realized in full crop years, and particularly in seasons when the weather is dry at ripening time and other conditions favorable.

Pres. BERCKMANS: "Gentlemen, Mr. Fulton is before you. He has covered the subject pretty fully, but still there may be some point about which you would like to ask him, and I am sure he will be glad to answer any questions you may wish to ask."

Prof. SCOTT: "There is one point in connection with the work that is being carried on by the Department, which has been brought out this year, and which is of local interest, that is, that attempts to make export shipments were defeated by the transportation companies. Prof. Powell, who has been some time in Georgia working on this problem during the past season, asked me to superintend the packing and loading of 100 crates intended for London shipment. The fruit was packed and loaded on the car on Monday, and the car moved out Monday night to be loaded on steamer for London Saturday at 6 o'clock. This car was so delayed that it did not reach New York in time to catch that steamer. Seems to me something was wrong there. Prof. Powell says that this long delay decreased the value of that fruit $1.00 to $1.50 per crate. I think it has been the experience of several shippers this season that transportation has not been sufficiently rapid to place their fruit on the market before it has become damaged. Someone told me that something like 30 cars of fruit were condemned in one day in New York on account of its having arrived in poor condition."

Mr. BRYANT: "I would like to ask what agency is employed to dispose of these peaches on the other side."

Mr. FULTON: "The fruit is consigned, and sold on its merits as any ordinary consignments are."

Mr. MILLER: "I might give you an idea from our experience this season emphasizing the importance of promptness in furnishing cars for transportation. We handled some peaches this year, and owing to the failure of the transportation companies to provide refrigerators for us, as ordered, we had about two carloads of peaches that lay in the depot 24 hours before

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they could be loaded. We estimated a loss of about 75 cents per crate on account of this delay."

Prof. GREEN: "I would like to inquire of Mr. Fulton if it would not be best to ship peaches to London direct from Savannah or Galveston instead of around by New York."

Mr. FULTON: "I think not, from the fact that the steamships plying from those points are not properly fitted for export trade. Those which are fitted up for export trade are tied up to some extent, also, so that it is difficult to get space, unless contracted for considerably in advance."

Pres. BERCKMANS: "The next business in order will be the report of Prof. W. M. Scott, of the State Board of Entomology, on "Some Recent Experiments with Insecticides and Fungicides." As the Professor gives us the report of the year's work, I know you will be interested in what he has to say to you. I shall request Vice President Starnes to temporarily take the chair."

Prof. Scott then addressed the Convention as follows:

Some Recent Spraying Experiments.

BY W. M. SCOTT, STATE ENTOMOLOGIST.

An important feature of the work of the Georgia State Board of Entomology is to determine the best methods of combatting injurious insects and diseases. To this end several experiments with insecticides and fungicides are conducted annually by the Department. The past season's tests have been confined chiefly to remedial measures for the San Jose scale, brown rot of the peach and the peach leaf-curl disease—three important factors affecting the peach industry of the State.

THE LIME-SULPHUR-SALT WASH AS A REMEDY FOR THE SAN JOSE SCALE.

For many years this wash has been the chief remedy for the San Jose scale in the orchards of the Pacific Coast, but not until within the past two years was it tested sufficiently to determine its value in the East. During the winter of 1901-'02 we conducted extensive tests with various insecticides against the scale, including the lime-sulphur-salt wash.* So successful was the outcome of our test with this wash and so uniformly good were the results reported from other States, particularly Illinois, New Jersey and Maryland, that we did not hesitate to recommend its use in Georgia orchards last season. Several growers in different sections of the State

* Georgia State Board of Entomology Bul. No. 4, 1902.

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used the wash, thus affording an opportunity to determine its efficiency under different conditions. The results obtained in some of the larger orchards will be referred to in connection with the following statements of experiments:

I. *Two Applications.*—This test was made in a three year old peach orchard at Marshallville, Ga., and 50 trees each of the varieties Elberta and Belle were sprayed with the lime-sulphur-salt wash prepared in the regular way from the formula given below. The first application was made on December 18, 1902, and the second on March 10, 1903. At the time of the second application the trees were nearly in full bloom and the leaf buds were pushing out. This application should have been made earlier, but the work was unavoidably delayed and some injurious results were expected.

Examination on April 23 showed some live females which had apparently developed imperfectly and, although mature, had not commenced breeding. The percentage of living scale was surprisingly small, the previous year's tests not having shown satisfactory results until July. On May 20 a still smaller number of living scales could be found. Some adult females still remained alive, but no breeding was observed except on one tree where young were crawling and quite a number had settled.

On June 16 twenty of the formerly badly infested trees of this plot were given a special examination with the following results: Twelve trees showed no live scale whatever, some of the foliage on four was slightly infested with young larvae, but the breeding females evidently present could not be located; two showed one live scale each, and one carried quite a sprinkle of old females that were still living. A general inspection of the plot revealed no further infestation. Trees that were in a dying condition last fall were practically freed from scale and were taking on good growth. The old scales were rapidly peeling off, leaving the bark with a clean appearance once more. When the last examination was made on July 11 conditions had not materially changed.

As was expected from the late spraying a considerable per cent. of the bloom had been killed and many small twigs were killed back several inches, but no permanent damage to the trees resulted.

II. *Early Winter Application.*—In this plot 200 trees, equally divided between the two varieties Elberta and Belle, were used. One application of the lime-sulphur-salt wash was made on December 18, 1902, and the trees were left without further treatment.

Examination on April 23 showed that although a large per cent. of the scale had been killed a sufficient number of apparently vigorous females were left to fully re-stock the trees by fall. Breeding had commenced and quite a sprinkle of young were observed. On May 20 the conditions had not materially improved. Young were still issuing and some larvae had reached about half-growth. It was evident, however, that the process of multiplication had been greatly retarded by the presence of the wash. Further examination on June 16 and July 11 showed an abundance of living scale insects on all trees that were badly infested when treated. The

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young scales had largely migrated to the new growth and to the foliage, as though avoiding the surfaces to which the wash had been applied.

On the other hand, however, the wash was quite effective in destroying the scale on trees that were only slightly infested when the application was made. In such cases practically no live scale could be found. On a few trees some crawling young were observed, but in most cases no evidence of breeding could be seen. Upon the whole, however, the December application alone appears to be satisfactory, owing, perhaps, to the action of the heavy winter rains in washing it off before breeding began.

IV. *Spring Application.*—It was intended to make this test in the same orchard with Nos. 1 and 2, but the block reserved for this purpose was sprayed with oil through a misunderstanding, and the orchard of the Ohio Fruit Land Co., at Myrtle, Ga., which was being treated by Mr. C. W. Withoft, manager, under the directions of this department, was chosen.

During February and early March a block of 17,000 two-year-old peach trees (Elberta, Belle and St. John) was sprayed with the lime-sulphur-salt wash. The entire orchard was taken under observation for the purpose of this test, but the notes have been made up chiefly from observations on trees sprayed March 10th, when the writer was present. (See Fig. 1.)

On April 22 a number of encrusted trees were examined and at least twenty per cent. of the scales was found to be alive. The presence of the mixture upon the trees was still in evidence and it was observed that the scales were so thin that the outlines of the insects beneath could be seen by the aid of a lens. In many cases this scaly covering had ruptured, leaving the insect entirely exposed, though apparently alive. On most of the trees examined no young were found.

Observations from time to time showed that the infestation on these was continually decreasing, and on June 17, the date of last examination, less than five per cent. of the scales appeared to be alive. There had been practically no breeding and the general examination of the orchard at this date showed only a very slight infestation, even on trees formerly encrusted.

No injurious effect could be observed on trees sprayed while in a dormant condition, but small twigs and the ends of the limbs were killed back several inches by applications made after the first blooms began to appear.

V. *Lime-Sulphur-Bluestone Wash.*—In connection with some other work at Sylvester, Ga., it was found convenient to test this wash, and 50 Carman peach trees four years old were treated. For comparison the same number of trees in adjacent rows were sprayed with the lime-sulphur-salt wash. The applications were made on February 6 and a heavy rain fell that night. The bluestone wash was made by the substitution of 5 pounds of copper sulphate for the salt in the regular wash. The bluestone, which was added after boiling the lime and sulphur together for an hour, appeared to unite with the excess of lime in such a way as to make a heavy preparation not so easily applied as the regular wash.

Up to May 21, when the last observation was made, the results were

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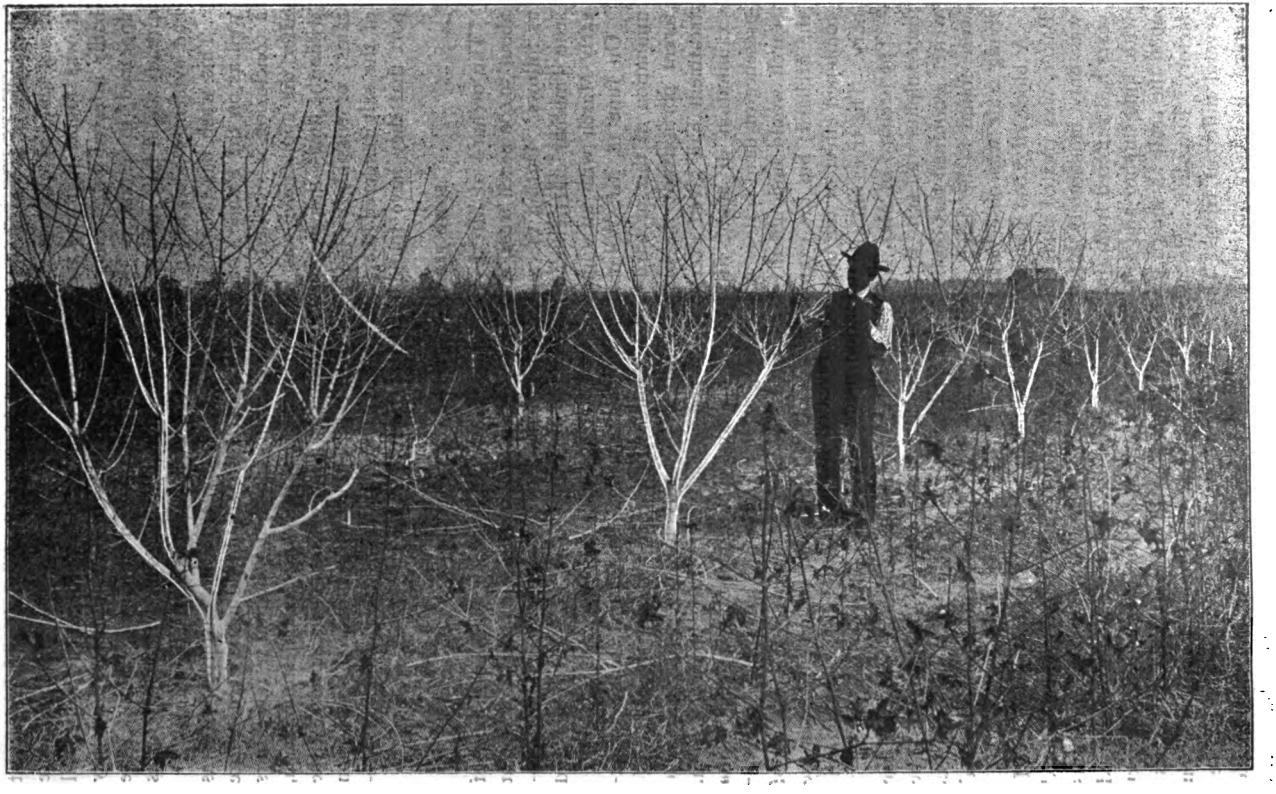

Fig. 1. Trees sprayed with the Lime-Sulphur-Salt wash, showing the consequent white coating. (Photo by the author.)

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decidedly in favor of the lime-sulphur-and-salt, which had proved almost if not quite as effective here as in the test at Myrtle. On the above date it was found that the trees sprayed with the bluestone wash were still badly infested with scale. Young were issuing in great numbers and they appeared to establish themselves without inconvenience. Some were already about half mature. A large per cent. of the over-wintered females had evidently been killed, but the treatment was quite unsatisfactory.

This wash has been successfully used in some of the Eastern States as well as on the Pacific Coast, and further tests should be made here before a conclusion is reached. The heavy rains which fell within a few hours after the application was made may have washed off the bluestone wash, while the lime-sulphur-and-salt appears to have withstood the action of the rains; or possibly the addition of the bluestone rather than the omission of the salt rendered the wash less effective, as several experimenters report that they have found salt unnecessary.

SOME RESULTS OBTAINED BY THE GROWERS.

The orchard of Mr. J. D. Hendrickson at Lee Pope, Ga., consisting of about 50,000 peach trees, was treated under the direction of the Department as follows: During the month of January a 15 per cent. strength of kerosene (mechanical mixture) was applied, followed in late February and early March with an application of the lime-sulphur-salt wash.

On June 18, Mr. Wilmon Newell, Assistant Entomologist, made an examination of this orchard and his notes show that although trees in different portions of the orchard had been badly infested with scale, the treatment had given exceptionally good results. In fact, upon a careful examination of about fifty trees, previously infested—as shown by the presence of dead scales—not a living scale insect could be found. Further search would undoubtedly have revealed living scale in some portions of the orchard; but the examination made was sufficient to indicate that the combined effect of the oil, and of the lime-sulphur-and-salt was extraordinary. The trees showed no injurious effect of the double spraying.

The orchard of Maj. G. T. Jones, of Fort Valley, Ga., also received the lime-sulphur-and-salt treatment during the month of February. The writer examined this orchard on April 22 and May 19th. The scale insects were found to be dying very rapidly and on June 17 only an occasional living scale was observed.

A block of 2,000 peach trees at Baldwin, Ga., belonging to Mr. A. M. Baker, was treated under the writer's personal supervision. This orchard was only moderately infested with the San Jose scale, but in previous years had suffered from the peach leaf-curl disease. The trees were treated with lime-sulphur-and-salt during the first week in March. The effect upon the scale as shown by the examination made June 23 was quite satisfactory. Four live scales were found out of several hundred examined, on several different trees. The leaf-curl disease, although not entirely prevented, had been materially checked. The application was perhaps made too late to produce the best results against this disease, but the foliage was

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remarkably free compared with an adjacent block that had been left untreated. It was shown in a separate experiment, which will be discussed later, that the leaf-curl disease can be completely controlled by the lime-sulphur-salt wash.

SUMMER TESTS WITH THE LIME-SULPHUR-SALT WASH.

A treatment that could be applied during the growing season for the purpose of checking the progress of the scale and preventing destruction of the trees until winter applications could be made has been a long-felt want. During the past summer the writer conducted a series of experiments with the lime-sulphur-salt wash to test its value as a remedy for the scale during the growing season. The wash was prepared in the regular way, and on April 2 was applied to the trees by the use of a paint brush, the trunk and larger limbs being thoroughly coated well up toward the top. Twenty trees were thus treated with the full strength wash, the same number with three-fourths the regular strength, and a like number with half strength. The mixture was of course kept off the foliage and new growth and for several inches back the ends of the branches were left untreated.

These plots were last examined on June 17 and it was found that where the full strength was used fifty to seventy-five per cent. of the scale had been killed on two badly infested trees, and that on all of the others in the plot practically no live scale could be found except on the untreated ends of the limbs and on the foliage. The amount of scale on these trees had been so reduced as to insure the life of the trees until winter treatment could be applied. The results from the more dilute applications were apparently less satisfactory, but even here the infestation was materially reduced. It appears, therefore, that with this wash badly infested trees may be so treated as to prevent material scale injury until winter applications can be made.

FORMULA AND PREPARATION.

Several different formulae were tested, but no particular reason was found for changing from the one used in last year's experiments, which is as follows:

Lime, unslaked ..... 30 pounds
Sulphur, ground ..... 20 pounds
Salt ..... 15 pounds
Water ..... 60 gallons

Place eight or ten gallons of water in an iron kettle over a fire and when the boiling point is reached add the unslaked lime. (Stir in the sulphur rapidly while the lime is slaking and from time to time add a small quantity of water as needed to prevent boiling over or burning. In the tests it was found that the least quantity of water used while the mixture was cooking gave the best results. The sulphur goes into solution gradually and the mixture, at first thick, becomes thinner as the boiling continues. After an hour of constant boiling the salt should be added and

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Fig. 2. Lime-Sulphur-Salt plant used by Mr. C. W. Withoft at Myrtle, Ga. (Photo by the author.)

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the boiling continued for another hour. However, the salt may be added at any time during the process of boiling. Then dilute with the required amount of water, preferably hot water, and the wash is ready for application.

If a suitable boiler is convenient the mixture may be more economically cooked in barrels or tanks by the use of steam, and where larger orchards are to be sprayed steam cooking becomes a necessity. The steam plant constructed and used by Mr. Withoft in the Ohio Fruit Land Co's. orchard at Myrtle, Ga., has a capacity for about 5,000 gallons of mixture per day. This outfit is shown at Fig. 2. A smaller plant used by Maj. G. T. Jones, at Fort Balley, Ga., is a convenient outfit for less extensive work. (See Fig. 3.)

CONCLUSIONS.

From the experiments and practical orchard tests recited above we may conclude:

1. That the lime-sulphur-salt wash is the most satisfactory remedy for the San Jose scale that has yet been tested by the department.
2. That its effect upon the scale is not immediate but accumulative, resulting in a gradual decrease of infestation during the summer.
3. That a late winter or spring application is much more effective than an early winter application and that two applications give the best results.
4. That the wash has no ill effect upon dormant peach trees, but may kill small twigs and the ends of limbs when applied after the buds begin to open.
5. That the wash is a combined insecticide and fungicide, forming an effective remedy for both the San Jose scale and the peach leaf-curl disease in one application.
6. That when applied by the use of a paint brush during the summer it effectually checks the progress of the scale until a winter treatment can be applied.

PEACH LEAF-CURL EXPERIMENT.

This disease has for several years caused much aprehension among the fruit growers of North Georgia and at the meeting of the North Georgia Fruit Growers' Association in May, 1902, it formed the chief subject of discussion, many growers expressing a doubt as to the efficiency of Bordeaux mixture as a remedy. Although the experiments conducted by this department during the two years had shown conclusively that Leaf-Curl could be readily controlled by the use of Bordeaux,* some of the growers had failed to secure good results and had lost heavily from attacks of the disease in spite of spraying. It, therefore, became desirable to repeat the Bordeaux experiments and to test the lime-sulphur compounds, Mr. W. F. Summerour, of Dalton, Ga., proposed to furnish the necessary equipment and labor and accordingly the tests were made in his orchard. A block of Carman that had, the previous year, not only lost its foliage but

*Georgia State Board of Entomology Bul. No. 6, 1902, pp. 10-11.

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Fig. 3. Lime-Sulphur-Salt plant used by Maj. G. T. Jones at Fort Valley, Ga. (Photo by the author.)

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the entire fruit crop, as well, from the leaf-curl disease, was selected for the experiment.

The spraying was done on February 10th, and under what were considered very unfavorable conditions. A light rain began falling about the middle of the forenoon and this continued until the middle of the afternoon, when the showers became so heavy that the work had to be discontinued. About half of the spraying was done during the rain and that night one of the heaviest rains of the season fell.

The plots were arranged as follows:

Plot I. *Bordeaux Mixture.*—This plot consisted of 92 trees, covering four rows and the Bordeaux mixture was prepared in the regular way from 5 pounds of copper sulphate and 5 pounds of lime to 50 gallons of water. Rain began falling before the coat was dry.

II. *The Lime-Sulphur-Salt Wash.*—This wash was prepared in the same way as for the treatment of the San Jose scale and applied to 46 trees in two rows adjacent to plot I. About half of the trees were sprayed during a light rain.

III. *The Lime-Sulphur-Bluestone Wash.*—In the preparation of this wash five pounds of bluestone were substituted for the salt in the regular lime-sulphur-salt wash. The bluestone was added after the lime and sulphur had been boiling together for an hour and the boiling was continued for another hour. Two rows of 23 trees each were treated and the application was made during the rain.

It was intended to make further tests, but the work was discontinued on account of the rain. The mixtures were apparently washed off almost as rapidly as they were applied and good results were not expected. On the contrary, however, no better results could be desired. The plots were examined on May 13 and it was observed that the disease had been prevented almost absolutely on all three of the plots. No difference in the effect of the three separate mixtures could be found—in fact practically no leaf-curl could be found on any of the sprayed trees. One or more diseased leaves occurred on the ends of some of the twigs, but even this was rare. It would appear that instead of defeating the object of the application the rain had a beneficial effect. Probably the mixtures were distributed by the rain to portions of the trees that ordinarily would not have been reached.

In all, eight rows running through the center of the Carman block were sprayed, leaving a number of rows on each side untreated. So marked was the effect of the treatment that the sprayed trees with their luxuriant foliage looked as though they had been highly fertilized and they could be easily distinguished from the unsprayed rows by one standing on an eminence at a distance of nearly one mile. The untreated trees had developed the leaf-curl disease to a serious extent, at least 80 per cent. of the foliage being affected, and at the time of examination, May 13, the diseased leaves were falling rapidly.

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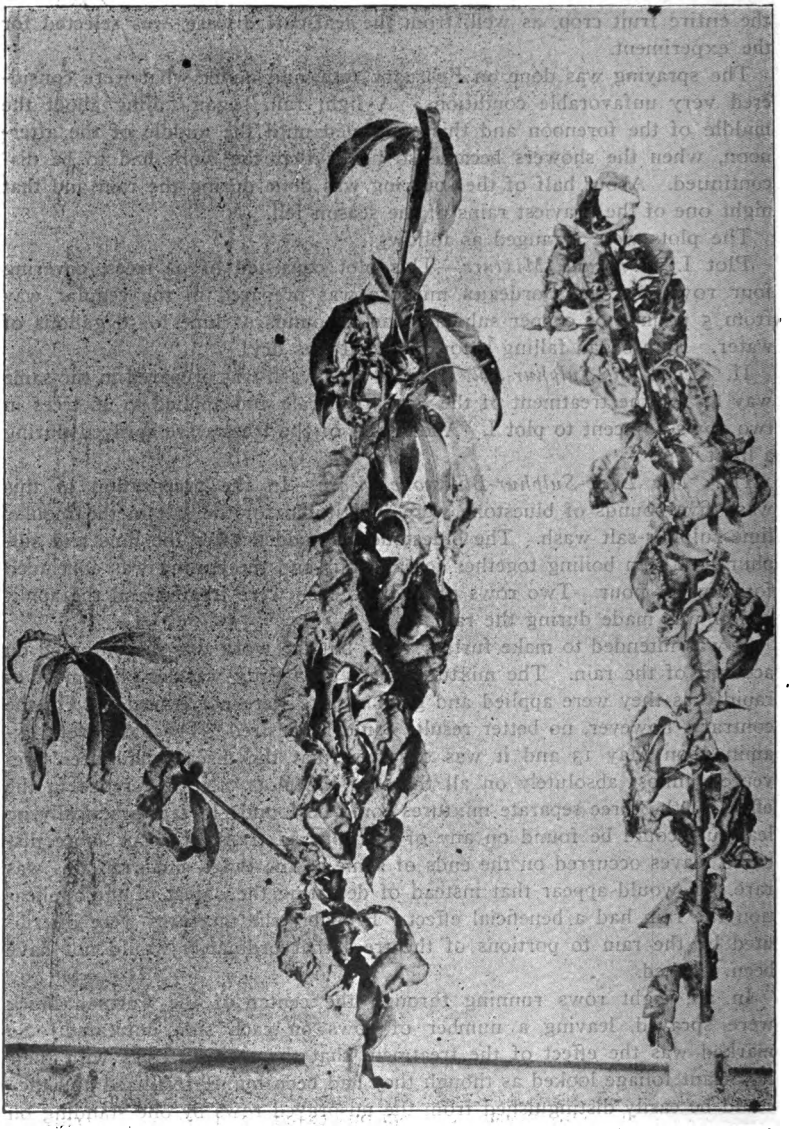

Fig. 4. The Peach Leaf-Curl disease. (Photo by the author.)

CONCLUSIONS.

Nothing really new was established by these tests, as it was already well known that the leaf-curl disease could be readily controlled by the use of

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Bordeaux mixture and that the lime-sulphur-salt wash had been successfully used on the Pacific Coast as a remedy for this disease. However, the following points were emphasized:

1. Peach leaf-curl yields more readily to proper treatment than perhaps any other disease with which the fruit grower has to contend, either copper or sulphur preparations affording absolute protection in a single application.

2. The lime-sulphur-salt wash, being also a remedy for the San Jose scale, may be successfully used to combat two evils in a single spraying where both leaf-curl and scale occur together in the same orchard.

Chairman STARNES: "Prof. Scott's paper is perhaps the most important part of the program for today, and if you have any questions which you would like to ask him I am sure he will be glad to further explain any point."

Col. I. C. WADE: "We are all very much interested in this paper of Prof. Scott. I had a letter and several circulars recently from a gentleman in Canada, accompanied by letters from high officials, in which they state that they have got a sort of a preparation to clean up such things as San Jose scale, curl, and other things that are causing us so much trouble. What I want to get at is if there is any way that we can inject any material into the tree to get rid of these pests and diseases of our trees? This gentleman offered his formula to me for a million dollars. I did not buy it for two reasons: one was I could not spare the money, and the other was that I had no faith in it."

Chairman STARNES: "That's long since a back number, but Prof. Scott will reply."

Prof. SCOTT: "In reply to that question I will say that those things are continually bobbing up, but we have not time, really, to test them all. There is something coming to the office of the State Entomologist in Atlanta every day in the way of remedies for San Jose scale, and other diseases of the trees. We have tested some of these, and also some for brown rot, but I do not see that any good has ever come of it. I think so far we have nothing that can be injected into the tree that will prevent these troubles. I will state, however, that there is a Frenchman working on the problem of injecting a fluid into a tree, that will make it immune, like vaccination for small pox. His name I cannot recall at this time, but scientists are

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giving some attention to his work along this line. As yet, however, there is nothing definite—nothing that can be put in practice."

Col. WADE: "I did not have any faith in this offer from the Canada gentleman, but I know that injecting fluids or other foreign matter into a tree will affect it—as, instance, driving a nail into a tree will affect the coloring of the peach."

Mr. W. D. HAMMOCK: "I want to ask if, when the lady-bird is destroying the scale, you should want to spray your orchard, would not the spray kill the lady-bird as well as the scale?"

Prof. SCOTT: "The lady-bird hibernates for the most part in the beetle state, and seeks the crevices of the bark or the base of the tree, so that during the greater portion of the winter she is protected from the application of insecticides. Moreover, it is not likely that the application of oils and other insecticides would kill the beetles. I should say in one sentence in reply to that question that a small percentage would be killed, perhaps, but the larger per cent. would come through an application of insecticide or fungicide safely."

Maj. RYALS: "If we had the lady-birds would we have any occasion to put this lime, salt, and sulphur on the trees?"

Prof. SCOTT: "As I stated a while ago, as yet the use of the lady-bird is an experiment. The outcome is not yet determined, and we have to get it established in our orchards before we can tell what it's going to do. If we put the lady-birds into an orchard, we cannot depend upon these lady-birds to clean up the scale until they have had time to increase and cope with the scale. While it is in progress we have to continue to spray our orchards and to hold the scale in check. At first the San Jose scale would no doubt breed much more rapidly than the lady-birds, the latter being in very much smaller numbers, and after all we have to depend upon the spraying. There is no harm in making the experiment. There is no expense attached to it, and it will be a valuable ally, particularly in holding the scale in check in towns and on private grounds, where the people are disinclined to spray. The greatest advantage will be from the use of the lady-bird in small family orchards, where spraying is not practiced."

Maj. RYALS: "Now say that a man had 10,000 trees in one

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place, and 50,000 trees elsewhere. Couldn't he spray the 50,000 trees, and leave the lady-birds to attend to the others? Couldn't he spray with oil all the orchard, and be satisfied that he had done the work sufficiently, and then put in the lady-birds to keep down the scale, provided he could put them in in sufficient quantities?"

Prof. SCOTT: "I don't know about that. We are passing through the first season with them. They are working on the scale, but it is as yet an experiment."

Col. FORT: "I have succeded in controlling this scale in my orchard in a cheaper and simpler manner than that suggested by Prof. Scott. I use a machine that throws a preparation of oil and water, and use a knapsack sprayer. I have never lost a tree in my orchard from spraying. I use 15 per cent of oil in the fall and 20 per cent. in the spring. Two or three days ago I examined my orchard, and we failed to find a live scale in the orchard. I found the lady-bird in my orchard also. These two sprayings have kept down the scale, and probably the lady-birds have aided to some extent also. I examine very carefully with a glass for the scale, and, if I find the scale in my orchard when I examine again in the fall, I will proceed to spray them."

A MEMBER: "What kind of a microscope do you use?"

Col. FORT: "Just an ordinary glass. You can get one for fifty cents.

Maj. RYALS: "I find that spraying is necessary. I did not think it necessary last winter to spray my orchard, but I find that it is. There is no trouble about the oil. If used in the proper way, you will never kill the trees. I never lost a tree except a few I purposely killed."

Prof. SCOTT: "I desire to corroborate the statements made by Col. Fort and Major Ryals. I have watched the effects in Col. Fort's orchard, and he has had remarkable success in controlling the San Jose scale. The scale has been in his orchard six or seven years, but it has made no progress, and has done almost no damage.

In the case of Major Ryals, he began the treatment with the oil in 1898, I believe using 15 per cent. strength at first, and he kept that up until last winter, when upon examination he did not deem it necessary to spray because his orchard was

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so nearly free from scale. I want to say in this connection that in this paper I was only reciting the experiments that we made the last season. The question of the oil treatment was pretty thoroughly covered before this Society last year, but since that time there have developed some new experiences in connection with the oil treatment, and during the past winter considerable damage was done by the use of oil in the orchards. I might mention one case, which was given considerable notoriety, and that was the orchard of Mr. W. C. Wright at Fort Valley. It was reported that he had killed 40,000 trees by spraying with oil last spring. I went down to see Mr. Wright, and he said he killed 1,500 trees out of an orchard of 75,000, which he sprayed with two applications of oil. The 1,500 trees were killed by one pump, which did not work satisfactorily, and Mr. Wright, was very indignant over the reports sent out because he considered it a reflection upon his ability to manage his orchard.

"Another instance was an orchard at Marshallville, where the spray was made with crude petroleum, and supposed to be an emulsion of soap. The trees were killed because the oil rose to the top, and the orchard was sprayed practically with pure oil—full strength. We all know that pure oil is injurious to plant life, and that in the State of Georgia, if applied too strong, it will kill trees."

Mr. Hammock told his experience with spraying. He said he sprayed his orchard, all except five rows, which he left unintentionally, as he intended, when he returned home after a brief absence, to finish spraying the orchard. For some reason the five rows were not sprayed at all, and they were the only live trees left, as he killed all that he did spray.

Upon being asked what per cent. he used, he said he did not know whether he used 15 or 100 per cent., but he knew he killed his trees.

A MEMBER: "How about the scale?" (Laughter.)

Mr. HAMMOCK: "I cleaned the orchard of scale. I didn't need any lady-birds to help me, either. It was certainly effectually done." (Applause.)

Chairman STARNES: "The next feature of the program will be a paper by Mr. G. H. Miller, of Rome, Ga., entitled 'Some

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Lessons Learned the Past Year.' As your former efficient Secretary for many years, he is too well known by you to require an introduction."

Mr. Miller then addressed the Convention as follows:

Some Lessons Learned the Past Year.

BY G. H. MILLER.

Mr. President and Gentlemen of the Georgia State Horticultural Society:

In considering the subject that has been suggested to me, (some lessons of the past year), we will have nothing new to offer, but shall only endeavor to put emphasis on some lessons with which we are already more or less familiar.

One lesson which we will emphasize, is that fruit growers should have business ability. They need business ability, especially when they go to market their crop. The question is sometimes asked, Why cannot farmers and fruit growers work together as business men do? The only reason they cannot get together, is because they are not business men. All manufacturing industries of the counrty work together, and great business combines work together, and why should not fruit growers? The business man must have confidence not only in himself, but with all those with whom he comes in contact, before they can do business. This is one of the great needs of the fruit growers. Education will help, but education in its restricted sense is not enough—actual contact in a business relation must come with it. Speaking of confidence, it is a sad fact that some of our fruit growers are too confiding, that is, they place their confidence unwisely, without having thoroughly investigated the integrity and financial standing of those who solicit their trade. We have in mind now one very excellent man, a peach grower, who last year had his first crop of peaches; he sold the crop to a party in whom we suppose he had confidence, and received an advance payment of $100.00, and while the crop should have made him $1,800.00, the $100.00 was all he ever received for it, the party to whom he sold being utterly irresponsible, as well as dishonest. We must learn before placing our confidence to be thoroughly assured, as we have intimated, that the parties in whom we confide are trustworthy. This leads us to refer to the importance of shippers' associations, and kindred associations whose objects is to help us to ship as cheaply as possible, and to sell products to the best advantage. All other industries and all other producing classes have their organizations, even the day laborer sets his own price in many sections of our country.

Another lesson which the observations of last year impressed, is the importance of more careful packing and handling of fruit. It was demonstrated last year and this year as well, that it is no use to ship fruit to market that is over-ripe, or specked, or bruised, and it is always economy to pack the baskets full—so closely that they will not jostle about while en

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route to market. While it may not always be possible to avoid fruit becoming specked while en route to market, on account of the delays that may occur, yet there was a general complaint of the peaches shipped from Middle Georgia this year, that they arrived in poor condition. We think they must have been affected by a fungus before shipping. We think it would be well to look into the matter and see if there is not some preventative for this fungus, by fumigation or otherwise. We do not see why the State Entomologist and the intelligent scientific fruit growers cannot devise a plan by which this could be done. In North Georgia we have had little complaint in regard to this matter this year, or last year either. The work of picking, packing, and shipping requires the most careful and minute superintendence in every particular, and the lesson of the past year is that growers who neglect these important items in any particular must suffer loss. And in view of the immense prospective development of the peach industry, when in a very few years we will have several times the amount of peaches to ship that we have now, the lesson must present itself to every one, that great care must be used in these particulars, and that some means must be devised for utilizing the fruit that is not strictly fancy, and also to provide for using the surplus, when the markets are glutted. It appears to us that we should provide plants for canning and evaporating fruit, and in this way utilize the surplus when the markets are glutted as we have indicated. We think it would be the part of wisdom for fruit growing centers to investigate this matter, and be prepared for it before the immense crop and glut comes. In this connection we may also say that it would be the part of wisdom to arrange for a more general distribution of the peach crop throughout the country. The great bulk of our crop goes to the large cities and the leading centers of business, but in a few years it will be necessary to distribute the crop as much as possible to the smaller towns all over the country. We also hope that by that time arrangements will be perfected that will enable us to ship peaches to European markets, so that we will be able to dispose of part of our surplus in that way.

Another lesson that we learn is that we must not neglect the cultivation of our orchards because the crop is a failure, or very nearly a failure. We have in mind two or three orchards this year that have been neglected, briars and weeds are allowed to grow, and while these orchards had a fair crop of peaches yet they were affected with fungus and rot, so that they were no profit to their owners. We have learned some lessons in regard to spraying fruit, but as we have with us our State Entomologist, who has given particular attention to this matter, we will not consume your time by referring to this subject, further than to say that we find spraying before the buds open in the spring a preventative of leaf-curl, with which we are troubled in North Georgia. Our experiences lead us to think that any time after January is the proper time for spraying, but owing to the rains and unfavorable conditions some orchards or parts of orchards, were not sprayed, but in the parts of the orchards where the spraying was done it was effectual in preventing the leaf-curl, and in the parts of the

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orchards not sprayed, the trees where almost defoliated by the leaf-curl, and one orchard of ours, of Carmans, set a good crop of peaches but not being sprayed, not only dropped all the leaves but quantities of fruit dropped, so there was only a small per centage of a crop. It should be remembered, however, that this spraying is more of a preventative measure than a curative one.

Another lesson that we have learned is that no fruit grower should undertake to do more than he can do well. Some of our fruit men get excited and plant out large areas in orchards and then find they cannot properly take care of them in regard to pruning, spraying, cultivating, picking, handling, etc., and as a consequence a great amount of work necessary for the success of the orchards is left undone, and so the business is just that far a failure. We think anyone should hesitate before going into a fruit venture, unless he can give it his personal superintendence. Of course, there may be exceptions to this rule, but as a general rule if the management and superintendence is entrusted to parties who are not directly interested the investment will not be successful.

Another lesson which should be emphasized (and in this we refer more especially to North Georgia) is the importance of being perfectly sure that the stock bought is absolutely free from San Jose scale and other injurious insects and diseases. There have come to our knowledge this year several instances of orchards, in a part of the country remote from railroads, where a few years ago trees were bought from infested sections and now it is necessary to destroy these orchards; in fact, some of them have been destroyed in order to get rid of the scale. This is very important, especially for those sections which have been so fortunate as to never have had the scale introduced among them. In this we know, "A word to the wise is sufficient."

Another lesson that we have learned is the importance of not confining our planting of fruit trees entirely to the peach. This lesson, perhaps, applies more particularly to North Georgia, where it has been proven that the apple, some varieties of pear, plums, grapes, and small fruits will do well. In fact considerable attention is being paid to the planting of commercial orchards of apples, so far usually of the summer and early fall varieties, and so far as our observation goes with very good promise of success. But as in every other industry, planters should not flatter themselves that they can succeed without giving the matter their individual, intelligent care, and using all known means to resist the insects, diseases, etc., with which they will be confronted. We are more and more impressed every year with the fact that apples for the holiday trade in the South could be grown in our own State. Car loads and train loads of apples for that trade are shipped from the North for that season, usually only second grade apples, and they invariably command good prices; whereas that demand could be met at home, where land is very much cheaper, and without the heavy expense of freight from shipping so far. The lesson here is that fruit growers should investigate this subject, in regard to the different varieties, soils, etc. These same remarks we have made in regard

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to apples, apply also to the other classes of fruits, as pears, cherries, grapes, etc.

Another lesson for commercial fruit growers is that they should provide themselves with all the labor saving instruments suitable for their work in the cultivation of their orchards. This is important from the fact that the price of labor is rapidly advancing, owing to the great demand for labor in other industrial lines; so that economy requires that planters should take advantage of everything that will enable them to cultivate and manage their orchards properly with less labor.

If we were to sum up the lessons of the past year in one word, that word would be thoroughness. Thoroughness in your investigations of parties in whom you put your confidence; thoroughness in cultivating, picking, packing and marketing, in a word, thoroughness in everything pertaining to the management of your orchards.

President BERCKMANS, (resuming the chair): "Gentlemen, I take pleasure in introducing Mr. E. E. Ewell, of the German Kali Works, Atlanta, Ga., who will read a paper upon 'Fertilizers for Orchard and Truck Crops.'"

Mr. Ewell then read the following paper, which was listened to with interest:

Fertilizers for Orchard Crops and Truck Crops.

BY E. E. EWELL.

Mr. President and Gentlemen:

This is indeed a large subject for a hot day. To undertake to run through the entire lists of fruits and vegetables, reviewing the best knowledge at present available, in regard to the fertilization of each, or even of typical groups of them, would annoy rather than instruct you. Moreover, it would be a needless waste of the time of this meeting, important as these details are for success. I say needless, because these subjects are all ably treated in a number of standard text books and other literature, some of which you possess or should possess, if you do not have them. Among them may be mentioned the bulletins of the United States Department of Agriculture and of the State Experiment Stations, the volumes of the rural science series, edited by that tireless worker, Prof. L. H. Bailey of Cornell University, and the books on agricultural chemistry by Prof. Harry Snyder of the University of Minnesota, etc. I should also mention an excellent article by Prof. Waite in the Year Book of the United States Department of Agriculture for 1902, which is devoted entirely to the culture and fertilization of peach orchards.

Avoiding all details in regard to special crops, I wish to discuss with you certain general principles governing the use of commercial fertilizers,

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that I am sure cannot be too often and strongly emphasized. As you know, the use of chemical manures, on an extended scale, is entirely a feature of modern agriculture. One hundred and three years ago the Prussian Academy of Science evidenced the limitation of the knowledge of plant chemistry and physiology of that period by appointing a committee for what seemed to them a very important purpose. It was directed to investigate whether the mineral matter in plants was derived from the soil in which they grew or whether it was in some mysterious way developed by them within the plants by some vital process. This sounds almost incredible to us at the present time, but it was not until about thirty years later that the foremost chemists were persuaded that organic compounds found in the animal and plant bodies obey the same chemical laws as do the substances found in other parts of nature. This revolution in the opinion of scientific men, relative to the necessity for the intervention of a vital force in the formation of organic substances, followed the demonstration by Wohler, that urea can readily be made in the laboratory.

This revolution in the chemical world preceded, but a few years, the revolution wrought by Liebig in the field of agricultural science, and doubtless paved the way for it. Until about 1840 the humus of the soil was generally regarded as the source of substantially all of the nourishment of the plant, including the carbon, which constitutes so large a part of all vegetable substances. The mineral substances had hitherto received comparatively little attention because their role in the workshop of the vegetable cell was not only unknown but scarcely suspected.

Liebig convinced the world that the organic matter of the soil is of relatively little importance as a plant food; that plants derive their carbon from the atmosphere and that the amount of the growth of plants on a given soil is determined by the abundance of certain mineral substances in it. Thus, only sixty-three short years ago, were formulated the scientific principles which made possible our modern scheme of rational fertilization with mineral manure. Useful as the humus is to give to many soils desirable physical properties, we now know that even its nitrogen is locked beyond the reach of the higher plants until it is unlocked by bacteria with which the soil teems and is changed first to ammonia and then to nitric acid or nitrates.

I have indulged in this historical resume for the purpose of reminding you that even the foremost scientists have only recently become somewhat familiar with the laws of plant feeding. Valuable as this information is, the next quarter or half century will undoubtedly witness other important advances. The greatest misfortune is, in my opinion, to be found in the fact that the most of the tillers of the soil in this country, excluding, of course, the fruit and truck growers, are from ten to fifty years behind the scientific investigators and teachers. This condition is rapidly changing since the establishment of our agricultural colleges and experiment stations with their various equipments and plans for the dissemination of information.

I have said that our present knowledge of plant nutrition will doubtless

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be greatly extended and possibly in some details be altered in the future. Practice, however, has shown that we have established the great fundamental principles and that our theories are good working hypotheses. Let us consider some of these fundamental principles.

As you know the greater part of plant structures is made up of carbon and the constituent elements of water. Or, as the Secretary of Agriculture tells the sugar-beet growers in advising them to produce sugar, the cell walls starch, the fats and the sugars are made of nothing but wind and water; when the farmer sells these, he sells things made from materials which cost him nothing. But the little workshops within the plant, the little microscopic cells, the real units in the plant and animal world, need certain tools with which to do their work.

These tools are found in the soil in which the plant grows. When we apply mineral plant foods, we are merely providing the little cells with an abundance of the necessary tools for the construction of the cellulose of the cell wall, the oil and fibre of the cotton seed, the oil and protein of nuts, the sugar and ethers of the peach, and in fact all the countless substances that are found in plants.

I have likened the plant cell to a workshop. Let me emphasize one important difference. In the workshop of man one tool or one material can sometimes be substituted for another. In the workshops of nature located in the cells of plants, this is never true. We are often asked which is the most important plant food. The true answer is none of them. They are all equally important. The relative amounts of them differ in different plants and the relative supplies of them in different soils vary, but every plant must have enough of every one of them. A deficiency of any one of them will limit the size and quality of the crop.

Water is the plant-food needed in greatest abundance by all plants. Hence the value of irrigation. You may pile on other foods by the ton, but in a drouth your crop will be limited by the water supply.

Moral: Don't "cuss" the fertilizer dealer when the leaves of your plants droop and fall off during a severe drouth. Practice shallow and frequent cultivation, pray for rain, and put in an irrigation plant if you can.

You horticulturists have the advantage over the general farmer in that you can afford to use an excess of fertilizers, with the possible exception of nitrogen, for fruits. I am convinced, however, that on the lighter sandy soils, even nitrogen is sometimes used with too sparing a hand. The experiments at Southern Pines, N. C., seem to indicate this, particularly in the case of peaches.

Another point that I wish to emphasize is that fertilizers must not be regarded as to any great extent a substitute for good culture, good pruning, and for general good husbandry. The best and most thorough farmer is universally the one who derives the most profit from the use of commerical fertilizers and often the one that uses the most liberal applications of them.

I have brought with me some photographs of some North Carolina vineyards that will illustrate the value of fertilizers as well as the value of

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good care, including pruning and culture. These vineyards are located on the "Sand Hills" of North Carolina, which will produce little besides dwarf pines and black-jack, and certain voracious native legumes, without the aid of some sort of manure.

In closing, if you want to have abundant crops, which come with thrifty and well fed plants, be to some extent book farmers and to some extent experimenters. Fertilize the larger part of your lands according to the best known practice, after studying how it should be modified, if necessary, to suit your condition. Then devote a little of your land and a little of your time to systematic experimentng with fertilizers and in other lines.

When the busy season is over, be a student; but at all times be an experimenter, and an investigator. I am sure you will find the time and money so expended a source of both pleasure and profit.

At the conclusion of Mr. Ewell's paper the Morning Session was adjourned.

AFTERNOON SESSION.

The afternoon session was called to order by President Berckmans at 3 o'clock, in the Opera House.

The following paper was read by Mr. Chas. T. Smith, of Concord, Ga.

The Relation of the Nurseryman to the Fruit Grower.

BY CHAS. T. SMITH, CONCORD, GA.

The fruit grower and the nurseryman divide honors in following the most ancient of all human callings. When Father Adam was placed in the Garden of Eden and commanded to dress and keep it, it is said that he began serving the world as the first nurseryman and horticulturist, thus combining the two lines as is often done in the present age. No other occupation in which man is engaged can trace its history quite so far back into the past.

Since the days of their ancient and honorable origin there has always been a kindly feeling in the hearts of the nurseryman and the horticulturist for each other. Engaged in kindred pursuits, their work possesses many points of similarity. The general nature of the work that must be done and the time that must elapse before definite results can be known, as well as the general environment of the business, are much alike. So much so is this that many nurserymen are largely engaged in fruit growing, while many whose principal business is orcharding are in the nursery business as a side line. The same class of ability that is required to make a

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success of the one is also necessary to bring satisfactory results in the other.

This relationship should certainly be not less cordial, as both are the recipients of valuable benefits on account of it. The thorough knowledge which the average nurseryman has of fruits, their culture, habits and productiveness can be made very useful to the professional as well as the amateur fruit grower. And while the orchardist is being benefited by this closer relationship the nurseryman is also receiving advantages in the advertising that he gets from the fine fruits that are produced by his stock, as well as the immediate profit he makes in each sale. The nurseryman, together with his right hand man, the tree salesman, constitute a power for good that is sometimes underrated. Go through the country in any direction and you will find evidences of their good work. Many homes are surounded by fine orchards laden with the choicest of fruits, while the door yards are embowered with beautiful flowers and ornamental shrubbery. These trees and plants were rarely ordered from the nursery without some solicitation. In almost every case it will be found that either the nurseryman himself or a nursery salesman induced the home owner to improve his place in this manner. Orchard planting is somewhat like life insurance, in more ways that one. It is an investment that brings a great deal of satisfaction and it usually pays its annual dividends, but the most decided similarity is in the fact that a great deal of talking must be done by some one who is earnestly enthusiastic on the subject before the policy is ever written, or the orchard ever planted. In the case of the orchard this talking usually falls to the nurseryman or the tree agent. There is scarcely a home that is provided with fine fruits through the season but its owner was talked into it by a tree man. Go further and you will find that a large percentage of the commercial fruit growers were also originally argued into the business by energetic tree men. Study the history of the prominent fruit sections of the State where peaches are shipped by the hundred car loads and if you will trace the business back to its infancy you will find almost invariably that it was started through the work of some nurseryman or tree salesman. The credit which the State has made for the production of the finest peaches in the world therefore may well be divided between the nurseryman and the orchardist. This is a big responsibility which the nurseryman carries and therefore he should exercise the greatest care that he grows only the best varieties of fruit and see to it that all orders are filled with good stock. The nurseryman should be an intelligent guide to the fruit grower. The average planter looks to him to be well posted as to what, when, where and how to plant, and the nurseryman should aim high in his business and try to post himself so thoroughly that he may not have to turn any customer or seeker for information away unsatisfied. The position of nurseryman is one of great importance to the country. It is a calling that one cannot just drop into and succeed at. He must go into it with earnestness and enthusiasm and make it a life study as well as a life business in order to be of any value to the country, or make anything out of it for himself.

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The nurseryman can only serve his part properly in the business by making it his permanent occupation and he cannot give his customers satisfaction by any other plan, as a nurseryman is not competent to advise a tree planter unless he makes the work his life business.

Since it takes several years for fruit trees to come into bearing so that the variety may be known, the nurseryman is honor bound in the transaction to look to the interests of the fruit grower, helping him to select trees that will best fulfil his purposes. Unfortunately for the nurseryman, the average tree planter usually makes his first, strongest and frequently the only condition on which he places his order for trees, that they shall be cheap. Cheap trees are what are wanted. They ask for cheap trees, forgetting that a thing that is cheap is usually not of much value. This condition often forces the nurseryman to give his attention to growing that sort of stock since he must supply the demand. I want to see the time when the average tree buyer will demand something else in his trees than that they be cheap. In buying other classes of stock and goods we do not look for cheap grades. Who of us in buying a mule asks for a cheap mule, or in buying a hat demands a cheap hat? Since an orchard is an investment that covers a long term of years, and its usefulness and value depend largely on the sort of trees that are planted, and since the cost of the trees is a small item in the expense of the business, it seems to me that the planter should give more attention to the sort of trees he is buying and let the matter of price be a secondary consideration. It is often the case that the difference between success and failure lies in the source from which came the trees, therefore let me urge the orchardist not to make the mistake of planting cheap trees. With the number of reliable nurseries that one may select from he need take no risk whatever in buying his trees.

The vital interests of the fruit grower are practically in the hands of the nurseryman, so he cannot be too careful what sort of stock he ships out. He must exercise special care that his varieties are true to name and that he don't send out something entirely different from what was wanted. To do this properly requires the careful attention of a competent and painstaking man. The matter of insects and diseases has come to be a very important item of in the nursery business. In addition to the annual inspection of all stock by a competent entomologist and the fumigation of everything shipped out, it is necessary that the nurseryman be eternally vigilant and on the lookout for scale, borer and blight.

The sale of good fruit trees of improved varieties and the improvement in the orchards that surround the homes throughout the country has been greatly hindered on account of lack of horticultural information amongst the masses of the people. This lack of general knowledge of fruits and fruit culture has had more to do with retarding the development of the fruit industry in this State than any other one thing. I am glad to know that this state of affairs is gradually passing away. The horticultural information given through the columns of our newspapers, together with the general circulation of the excellent catalogues which some of our

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leading nursery farms send out, and the good work done by many reliable salesman has tended to bring about a great improvement in the knowledge of horticulture amongst the people generally. There is much room for further dissemination of horticultural information, but with the present rapid spread of knowledge of the subject it can be only a short while until we will develop into a people of advanced scientific fruit growers.

Since the nurseryman has helped to build up the waste places and make good fruit grow where only the poor or none grew before, helping to create new and profitable fields and assisting to place these luxuries in the hands of many people, may we not style him a missionary of horticulture? Now I hope these missionary nurserymen may continue to do good work, helping to make our hilltops and valleys bloom and produce more beautiful and healthful fruit for the generations to come, assisting to grow luxuriant trees from whose branches may be plucked finer fruits and under the cool shade of which the nurseryman and the fruit grower may rest in harmony, peace and plenty.

Col. WADE: "Mr. President, inasmuch as this Society is about to lose Prof. Scott's efficient services as State Entomologist, and inasmuch as we wish to use every means within our power to keep him with us, we have drawn up two resolutions for adoption by this Society, which I desire to present. We prefer to adopt the first resolution, and then use every effort in our power to carry it into effect. If this should fail, then we desire to put into effect the second resolution, and see if out of one or the other of these measures we cannot accomplish our purpose of keeping Prof. Scott with us and prevent the serious loss to the interests of our State which would result if he left."

Whereas, Prof. W. M. Scott has resigned the position of State Entomologist, which he has filled so acceptably to the horticulturists and so profitably to the State at large, that the peach business during his incumbency has increased from six or eight millions to eighteen millions of trees, thereby adding not less than twenty-five million dollars to the farm valuation of our State;

And whereas, Within three years our output of fruit will amount to not less than twenty million of dollars per annum, thus adding this vast increment of wealth to the taxable property of our State;

And whereas, We believe that it is largely owing to the intelligent and energetic labor of Prof. Scott that this has been accomplished;

And whereas, the present occasion is one of great emergency by reason of Prof. Scott having already accepted a position under the United States Government which takes him out of the State,

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Therefore, Be it Resolved, First: As a matter of common equity we urge and insist that our Legislature *at once* appropriate from our Agricultural Fund, collected from the farmers by the fertilizer tax, a sum additional to the present appropriation of not less than $5,000 per annum, to be used to pay Prof. Scott an *additional* salary, and enable him to hire necessary assistants in the prosecution of his work.

Resolved, Second: That our President, aided by such members of our Society as he may wish to help him, immediately present these resolutions to the present Legislature.

This resolution was unanimously passed by the Society.

After the passage of this resolution Prof. Scott in a graceful rejoinder, expressed his appreciation of the confidence shown in him and his work, and paid a beautiful tribute to President Berckmans, who had, he said, been his constant adviser in all matters pertaining to horticulture since he had entered upon his duties in this State.

Continuing, Prof. Scott said that even if the definite action contemplated in these resolutions was taken, he did not see how he could rescind his own action in accepting a position with the Department of Agriculture at Washington. Still he was willing to leave the matter in the hands of the Society, and, if he could serve Georgia, he would gladly do so.

President BERCKMANS: "I will appoint a committee as soon as I can make up a list of the gentlemen who will be willing to go to Atlanta and take this matter up."

COMMITTEE REPORTS.

Reports of the Vice-Presidents.

REPORT OF THE SECOND CONGRESSIONAL DISTRICT.

To the Georgia State Horticultural Society:

The fruit industry in the Second District has not been very gratifying this year. In the first place, we started out with all of our trees infested with the scale and their vitality was badly impaired. Then the unfavorable spring caused our trees to cast off all but about one-fourth of an average crop. That seemed to do well and bid fair to make fine fruit; but by the time it began to show signs of maturity it became infested with the "brown rot." so we in the Second District did not realize more than one-sixth of a crop of peaches.

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There are some signs of improvement in horticulture in some portions of our section. I gave it as my opinion last year that the Second District was really the home of the peach, and that in some distant day a large portion of this district would abound with peaches, plums, and all other kinds of fruit. Our section is already famous for its fine watermelons. I don't think any section of the country can surpass it for fine fruit of every species. Some sections have succeeded this year with cantaloupes. All of the eastern portion of this district is fast developing as a fruit section. Take the counties of Worth, Colquitt, Berrien, Dougherty and Mitchell, and there is no finer section under the sun for the fruit industry. We have suffered a great deal with the scale but I think it is giving way to some extent. We would offer this suggestion to all in any way connected with horticulture: Be more vigilant in destroying the insects that destroy our crops. I don't think it will be long before horticulture will be profitable in our section of the country. In conclusion, let me say to you that we have nothing to complain of, but we would suggest to the railroads and express companies that they give us better rates on our fruits and thereby encourage the industry more than in any other way.

Respectfully submitted,

W. D. HAMMOCK,
V. P. 2d Congr. Dist.

REPORT OF THE THIRD CONGRESSIONAL DISTRICT.

To the Georgia State Horticultural Society:

Since our last meeting, and the last report from this district, horticultural matters have not been neglected here. The principal attention has been devoted to peaches and plums, and as large a planting of these fruits was made this year as usual—which is tantamount to saying that many hundred thousand new trees were set.

THE SCALE. This great question does not seem any nearer to a solution, so far as this section is concerned, than it was at the beginning. The results of spraying were not satisfactory, as a rule, this year. The usual spray employed was kerosene and crude petroleum, either in mechanical mixture or in emulsion. Where good results were obtained the previous year, the application of the same sprays, as far as growers were able to make the application the same, resulted in wholesale destruction of trees in many instances.

There seems to have been little difference, where the emulsion was used, from the results of use of the mechanical mixture. The peculiar results this year are inexplicable, though it seems to have been demonstrated that certain varieties of peaches are much more susceptible to injury from use of oil washes than others. As a rule the worst damage was done to the peach trees of the early varieties, it frequently happening that in the same orchard very serious damage was done to trees of the early varieties, while the later varieties, subjected to the identical experience, suffered little, if any, appreciable damage.

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The "California Wash," as it is called, consisting of lime, sulphur and salt, seems to have given better results, and the present idea of the most progressive and enterprising growers is to use this more extensively another season.

It seems that there is less damage to the tree from this wash, and the general results upon the scale, while possibly not as quick, are more lasting and more pronounced. This wash is not made in the same way always, but is varied. Some use with the lime and sulphur a proportion of coal tar, and apply it with brushes to the trunk and larger limbs of the trees, and think that very good results are thereby secured. However, there is much to be learned by experience, (much of which will perhaps be costly, as considerable past experience has been) as to what is the most advisable treatment for the San Jose Scale.

It seems to have been demonstrated by our observation that the scale is not always as sweeping in its devastation as we once thought it would be. In some orchards, parts have suffered severely, while other parts, without treatment of any kind, seem to have practically escaped damage. Where the scale has appeared in alarming numbers in the early part of the season, it frequently transpires that later in the season it disappears without serious results having happened to the trees infested. On the other hand, parts of the orchard which seem to be free from scale early in the season later become so covered and overrun with the scale as to be ruined.

At this time growers are thinking of a summer wash, as recommended by Prof. Scott, and instead of spraying the general orchard as heretofore, it is contemplated to apply the wash only to those trees that show infestation sufficiently advanced to be easily visible to the orchard hands at work upon the trees. The idea is growing that it is best to fight this pest only when it becomes visible to the naked eye, and to fight it all the time, or at least several times in the course of a year.

Cantaloupes were planted in this district to a considerable extent, and in some instances good crops were made and remunerative prices realized. This fruit can be raised successfully, however, only with great care and pains, and one not willing or prepared to give the best of cultivation and fertilization should not attempt the planting of cantaloupes. Experience in this, as well as in other special branches of horticulture, is indispensable to success.

Respectfully submitted,

H. A. MATHEWS,
V. P. 3d Congr. Dist.

REPORT OF THE FOURTH CONGRESSIONAL DISTRICT.

To the Georgia State Horticultural Society:

As Vice-President of the Fourth District am unable to make favorable report of fruit in this section. The crop of all kinds, except apples, is

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practically nothing. I do not think there will be a shipment made. Frost, rains and brown rot ruined the crop. Hoping better for the future, I am

Yours truly,

HENRY BANKS,
V. P. 4th Congr. Dist.

LAGRANGE, GA.

REPORT OF THE FIFTH CONGRESSIONAL DISTRICT.

To the Georgia State Horticultural Society:

Commercial orchards are but few in the Fifth District; nearly all orchards are for domestic purposes. The interest in horticulture is concentrated on truck and small fruit growing here for the Atlanta market, which is more remunerative than the orchards. Peaches have been greatly thinned by late frost, yet there is a sufficient, well developed crop retained. Apples escaped the frost and there is an unusually heavy crop; trees have been overlooked and the fruit is not as large as it would have been had it been proverly thinned. Plums are grown only in a very limited way, Wild Goose succeeds very well. The Japan varieties are not reliable; they are too often destroyed by late frost.

The small fruit crop of this year has succeeded well, the rains having been sufficient to make a full crop and the bearing season of strawberries has been unusually long—extending over two months. Raspberries have made a full crop where they have been free from cane blight. The blackberry made a fair crop and there is more interest taken in them every year and the demand is growing in the local market in proportion.

The seasons have been very favorable for all vegetables and insects not as numerous as common; consequently there has been really an over-production.

Respectfully submitted,

CHAS. DECKNER,
V. P. 5th Congr. Dist.

ATLANTA, GA.

REPORT OF SIXTH CONGRESSIONAL DISTRICT.

To the Georgia State Horticultural Society:

This congressional district is located nearer the center of Georgia and consequently nearer the heart of the peach growing section of the State, than any other district, and while the crop of fruits has not been so great as in some past years, still it has been remunerative from most orchards. The peaches have been unusually fine and large and the receipts from same have been satisfactory. Pears, plums, melons and cantaloupes, especially the last two, have been very encouraging in quality, quantity and in receipts from sales. Grapes and figs are very promising. Nurseries have scarcely been able to supply the demand made upon them, and many

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new orchardists have entered the field, believing that there is ample room in Georgia for many millions more of trees—and I am of their opinion.

Yours very truly,

R. E. PARK,
V. P. 6th Congr. Dist.

REPORT OF THE SEVENTH CONGRESSIONAL DISTRICT.

To the Georgia State Horticultural Society:

The fruit industry in our district has passed beyond the experimental stage. It has been very largely developed in the last few years and is still going on as extensively as ever. There will be large areas planted to peaches this fall.

The crop of peaches this year is quite light but it is proving to be a great deal larger than was expected. The last estimate places the shipments from this, Northwestern Georgia, at seventy-five cars for this year; whereas it was thought a month ago that there would not be twenty cars. The fruit is uniformly large and usually well colored; it is remarkably free from curculio stings and we are glad to say it is bringing good prices. There have been more Elbertas planted than all other varieties put together—perhaps three times as many. Quite a number have been planting Carman. Emma, which was popular a few years ago, has proved to be a rather shy bearer and for that reason is not being planted so largely. Lady Ingold has about been discarded for the same reason. But few of the early peaches are being planted here for the reason that when they are ripe with us South Georgia would have much better varieties on the market.

Plums were a very light crop this year—none to ship. Pears in some localities a very full crop; trees had to be thinned to keep limbs from breaking. Apples in some localities are a good crop, although but little attention has been paid to spraying, as yet, and in consequence many are wormy and unfit for market. There is considerable attention being paid to the planting of apples in commercial orchards. A few large orchards have been planted, mostly of the summer and early fall varieties.

Strawberries were a very good crop with us this year, owing to the good season and rains just before ripening. Raspberries are not grown in this section except on a limited scale. Wild blackberries are in abundance. Grapes are a full crop this year and free from rot. Of cantaloupes the acreage is very much smaller than last year; at this date shipments have commenced and the quality is represented as good.

Respectfully submitted,

G. H. MILLER,
V. P. 7th Congr. Dist.

ROME, GA.

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REPORT OF THE EIGHTH CONGRESSIONAL DISTRICT.

To the Georgia State Horticultural Society:

Unfortunately little progress in horticulture is observable in the Eighth District from year to year. Its citizens seem to sleep over their opportunities, and orchard and garden are unduly neglected, although there is no reason, climatic or otherwise, why this section should not take a more prominent position in truck production and in commercial fruit growing.

PEACHES.—This year, discouraging to the horticulturist in some districts, is one of fairly satisfactory results in the Eighth, notwithstanding the small crop obtained. This, however, was looked for, as it would have been unreasonable to expect a perpetual continuance of full crops. So, while peaches have yielded less than a third of a crop, on the average, yet what fruit there is seems of good size, and has brought fairly satisfactory prices, although less highly colored than usual. This, too, was to be expected, from the climatic conditions obtaining. These have also been particularly conducive to the spread of brown rot—the chief curse of the orchardist here, as everywhere else. Curculio, in addition, has been largely in evidence. The commercial planting of peaches is not greatly on the increase in this district.

APPLES are weighted down by an enormous crop this year—principally *Shockley* and *Yates*. *Terry* is being more extensively planted each season, and is evidently destined, in the near future, to displace *Shockley* altogether. Its quality is far superior and it is both a heavier and more certain bearer and a better keeper. *Stevenson's Winter* and *Cates' Winter* (both misnomers, as they are fall apples) are gaining in popularity.

PEARS—*Kieffer* and *Seckel* are the only varieties any longer worth troubling with. The latter will always hold its own as to quality, of which it is the criterion, but *Kieffer* is the more productive and attractive in appearance—besides filling the basket sooner, by reason of its greater size. It is therefore found more profitable. While it blights considerably it is yet of good constitution, possesses marvellous vitality and recovers rapidly under the knife. Our people are gradually learning to handle zymotic blight, cutting back severely ahead of the affection and putting the pear plat in permanent sod after the trees once come into bearing, and using thenceforward no nitrogenous fertilizer—only phosphoric acid and potash—and before that time, employing, after the first year, only commercial fertilizers, never touching lot manure.

JAPAN PLUMS are gradually coming into favor, but must be regularly sprayed to prove profitable.

NATIVE PLUMS are no longer worth cultivating here—not even *Wild Goose*—although a few varieties are of such good quality that they deserve to be more widely known, and would perhaps prove desirable where even *Wild Goose* fails. These are notably *Clifford, Milton* and *Munson*.

GRAPES are sadly "off" this season, bunching poorly and rotting worse, where not systematically sprayed. Grapes are a "back number" anyway, in this section—they yield no profit, commercially, and are of interest only to the amateur. Some of the newer varieties are worth mentioning—par-

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ticularly *Muench,* a large bunched, rather late black grape of excellent quality and a good shipper; *Venango,* the late red shipper recommended last season, and *Headlight,* one of Munson's latest, the best first early grape on the market.

STRAWBERRIES have done well, and the best succession for the home market still appears to be *Hoffman, Lady Thompson, Brandywine* and *Haverland* (P) maturing in the order named.

BLACKBERRIES, as a cultivated fruit, are gradually impressing their value upon our public. The *Mayes* Dewberry is especially profitable on account of its size and season; *Lucretia* cannot be mentioned in the same paragraph with it.

NUTS—particularly pecans—are attracting some attention and inquiry, but are not being planted to any great extent. Two varieties of Japan walnut—*Cordiformis* and *Sieboldtiana*—are well worth planting, as they are fairly rapid in growth and make fine, shapely trees. Spanish chestnuts (seedlings) are worth planting for landscape effect, if for nothing else, the trees are so handsome and symmetrical. Grafted varieties are too high in price, as yet, to supplant the seedlings. There is not enough difference in the fruit to warrant the extra cost, and the trees are not so shapely. None of the Japan chestnuts, either seedlings or grafted varieties, are particularly desirable in this district. Their fruit, while larger than that of the Spanish chestnut, is inferior and does not ripen up well.

FIGS.—While subject to occasional disaster from severe freezes throughout the district, the fig has been exempt from injury for several years past, and is justly a favorite with all. The most popular variety, and one of the earliest, still remains the little *Celestial. Madeleine,* however, is earlier and larger, but has a shorter season. *Black Provence* is about the size of *Celestial,* and much similar to it except in color. While its quality is not so high, it is most desirable, and bears throughout a long period. *Magnolia* or *Dalmatian* splits and sours too badly to be of any value, and *Brunswick* is a shy bearer and of poor quality here, notwithstanding its reputation to the contrary. *Brown Turkey* is still a standard for a late crop. The best of all, however, is *White* (or *Green*) *Ischia.* It is an abundant bearer, and seldom splits or sours, drying or shriveling up, instead, on the tree, and is of unsurpassed quality. While late, it is by far the best fig for this immediate section.

MISCELLANEOUS.—*Juneberries* and *Crandall Currants,* two small fruits which never fail under the ardent suns of this latitude, are attracting little by little, the attention they deserve. The latter is the only currant we can always get in this climate, and is good for jelly; while the former, when canned like blackberries, makes excellent pies, which greatly resemble seedless cherry tarts. Both should find a place in every home garden.

It is to be hoped, on the whole, that another year will bring with it brighter horticultural prospects than those we now confront.

Respectfully submitted,

HUGH N. STARNES,
V. P. 8th Congr. Dist.

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REPORT OF THE NINTH CONGRESSIONAL DISTRICT.

To the Georgia State Horticultural Society:

A good many commercial orchards have recently been started in this district. In Jackson, Hall, Habersham, and Rabun considerable interest is manifested in growing apples and peaches for market.

There is a fair crop of Apples this year of fine quality. The only drawback was the twig blight in the early spring which damaged some varieties very much.

There is about a half a crop of Peaches. Many trees failed to bloom, the buds I think, were killed before the blooming season; the fruit that has matured is of extra size and quality; some varieties rotted badly, as usual, while others—*Mamie Ross, Mountain Rose* and *Pallas*—were comparatively free from rot.

The Pear crop will be light on account of blight. *Early Harvest, Keiffer,* and *Seckel* are the only varieties that have a full crop.

There was a light crop of Cherries and Plums.

Strawberries were very fine and a full crop.

Grapes promise a full crop; very little rot so far; the early varieties are ripening up nicely. There is very little care taken of vineyards now, either in cultivating or spraying them.

The Paper-shell Pecan is being planted to some extent and will be planted extensively as soon as its true value becomes known. River and creek bottom land that is fertile and not too wet is probably the best place for the pecan, but any upland on which the hickory tree flourishes will produce fine pecans, and although the trees may not last as long, yet they will come into bearing earlier and produce as well as those on low land.

Respectfully submitted,

J. G. JUSTICE,

MARCUS, GA. .. *V. P. 9th Congr. Dist.*

REPORT OF THE TENTH CONGRESSIONAL DISTRICT.

To the Georgia State Horticultural Society:

PEACHES.—The peach crop, which is the most prominent in this section, has averaged about 25 per cent. for the entire district. The February freeze killed a large proportion of the bloom buds, but in a few favored localities the fruit set was an average crop. Some few commercial orchards were obliged to thin such varieties as *St. John, Mountain Rose, Belle* and *Thurber,* as these varieties set a full crop. The *Elbertas* generally set about 25 per cent. A few large orchards gave a full crop. The full crop produced in some orchards, as above stated, was due to proper cultivation, fertilization and pruning. This year the necessity of thorough and careful attention to orchards has given most satisfactory results. Orchards which were neglected gave practically no crops. This was plainly demonstrated when only a public road divided the orchards. Brown rot was most disastrous

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in many sections, even the old-field plums were affected. The climatic conditions during and previous to the ripening season were most favorable for the spread of the disease. Many experiments were made with Bordeaux and other fungicides and some very gratifying results were produced in the orchards of the Berckmans Bros. at Mayfield, where peach trees had six applications of Bordeaux, 3-9-50.

The prices for peaches were unsatisfactory this season. Owing to excessive moisture the fruit had poor carrying quality and the railroads generally gave very poor service. The majority of the cars were delayed two days in transit. If the railroads desire to encourage commercial fruit growing they should have more consideration for perishable products and endeavor to put shipments through to their destination in reasonable time. The car load minimum for peaches and plums should be reduced to a 4-ton load, as it is clearly demonstrated that the refrigerating capacity of the cars now in use is not sufficient for a 5-ton load. The planting of commercial orchards was increased by several hundred thousand trees in this district since our last report. The following are the leading commercial varieties: *St. John, Waddell, Carman, Mountain Rose, Red River, Elberta, Belle, Hiley, Thurber* and *Greensboro.*

PLUMS—Nearly all varieties produced a full crop; many of the Japan type had to be thinned.

APPLES—A short crop, fruit defective on account of coddling moth.

PEARS—*Keiffer* and *Le Conte* about 25 per cent. of a crop. Where trees have not received nitrogenous fertilizers they are almost entirely free from blight. In some sections blight is very disastrous.

GRAPES—Generally a fair crop; in some sections bunches did not fill out; this is no doubht due to imprefect pollination.

STRAWBERRIES—Produced an unusually fine crop; in many sections the fruit was to be had continually from April 1st until early in July. *Lady Thompson* took the lead. *Hoffman* for some unaccountable reason did not do so well this season. *Brandywine, Sample, Michel, Wilson* and *Sharpless* and the two above mentioned are the leading market varieties.

Prices for good stock were very satisfactory. It would pay the producers to give more attention to observing a uniformity in grading their fruit; placing large and small in same basket always tends to cut down prices. The small sizes govern the prices.

BLACKBERRIES AND DEWBERRIES—A heavy crop, as usual, and good stock commanded good prices.

RASPBERRIES---Were almost a failure except in a few localities.

FIGS—An abundant crop, and are being planted in some sections for commercial purposes. There is always a large demand for figs, but the difficulty in transporting this fruit has heretofore prevented its being planted on a large scale.

JAPAN PERSIMMONS—A good crop, and later in the season can be found on the fruit stands in the cities, but there will never be a large demand for this fruit.

PECANS AND JAPAN WALNUTS—Continue to be planted quite extensively,

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but sorry to report an immense number of so-called grafts and budded pecans are being sold in this section. Seedling pecans are cut at a bud and so manipulated as to give them the appearance of being budded trees.

CANTALOUPES—A large crop in some sections—quality poor with some growers. Quite a large acreage has been planted for shipping purposes, and good stock has paid well—principally *Rocky Ford*. Unless the soil and conditions and shipping facilities are most favorable, would not recommend embarking in the cultivation of cantaloupes.

WATERMELONS—From present outlook the melon-growers are disappointed, but hope that better weather conditions will improve the yield.

MALADIES—We have no peach leaf-curl in this district this year. Cases of rosette very recently seen. San Jose scale has not been reported in any new sections. Curculio as bad as usual, but when trees were jarred the fruit was not injured to any great extent. Brown rot is the great bugbear this year. The Colorado potato beetle made its appearance as usual, but Paris green or Swift's arsenate of lead keeps them in check.

VEGETABLES of all varieties were in abundance and generally commanded good prices. The producers should pay more attention to the proper grading and packing of their fruits and vegetables. Many shippers complain of poor returns and in the majority of cases blame their commission merchants. If they would only look at home they would discover the fault at their own door. The necessity of shipping only straight packed goods cannot be too much urged. The shipper should remember that if his products establish a reputation for good quality and uniform packing he will not have any difficulty in disposing of his goods even in a glutted market. Another point that is overlooked by a majority of shippers is feeling condition of the market by telegram before making consignment. A little telegram worded as follows: "Ready car of Elbertas, wire probable market," will save shippers many times the cost of a few such telegrams.

Respectfully submitted,

N. MCINNES,
V. P. 10th Congr. Dist.

REPORT OF THE ELEVENTH CONGRESSIONAL DISTRICT.

To the Georgia State Horticultural Society:

I respectfully submit the following as my report from the Eleventh Congressional District:

I may say, considered from almost every standpoint, this has been a most disastrous year for the fruit growers. So far as I am able to learn there has not been a successful crop of fruit in any locality within the district, saving, perhaps, strawberries, and owing to the excessively wet season very much of this fruit, like all other varieties, has been comparatively without flavor. The brown rot amongst peaches and plums has been almost universal and far more disastrous than during any previous year since we have been blessed (?) with this frightful disease—and equally dis-

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astrous with all varieties of plums. In my own orchard I have some dozen or more varieties of the Japan strain; some of these which had not heretofore shown the rot, were this year almost completely destroyed by it—*Berckmans* showing the least of any of the varieties.

The few peaches and plums that have been marketed have been extremely poor and undesirable; none of those that have come under my observation ought to have been put on the market. There is no apple crop worth commenting upon. The grapes are inferior, there being a fair crop, only, of scuppernongs. The San Jose scale seems to be gradually disappearing. I received a short time since a small collection of Asiatic lady-birds sent me by Professor Scott, our State Entomologist, which came in very excellent condition through the mail. Following his directions, in a half hour after receiving the packet I disposed of them as he directed by placing them on a tree. I regret to say, that after a diligent search from time to time, I have been unable to find one of them since the day I released them. I have hopes, however, that they will make their appearance in increased numbers at the proper season.

Respectfully submitted,

JNO. M. STUBBS,
V. P. 11th Congr. Dist.

Report of Auditing Committee.

The following report of the Auditing Committee was then read and adopted:

REPORT OF AUDITING COMMITTEE.

To the Georgia State Horticultural Society:

Your Auditing Committee have carefully examined the accounts of the Treasurer, L. A. Berckmans, and find the total receipts for the fiscal year, including balance brought forward, to be .. .. ..

Report of Committee on Exhibits.

The following report of the Committee on Peaches, Pears, Apples, Grapes, Nuts, etc .w as then read by Mr. H. C. White:

REPORT OF COMMITTEE ON FRUIT DISPLAY.

To the Georgia State Horticultural Society:

Your committee begs to report that the exhibit this season was not as large as heretofore nor up to the usual high standard, this being attributable to the unfavorable season; many sections being entirely killed out by late spring frosts. The early summer in many sections was extremely wet, causing brown rot with peaches. We desire to say that with very little effort upon the part of members of the Society that a very much finer and more representative exhibition could and should have been made, notwithstanding adverse weather conditions. We desire to call special attention to the enterprise of the Harmony Grove fruit growers, who thought it worth the trouble and expense to save perishable fruit by cold storage especially to exhibit at this Convention. We cannot too earnestly commend efforts of this kind and trust that another year many others will be guided by the Harmony Grove example. We note the individual exhibits as follows:

GEORGIA EXPERIMENT STATION.

Apples.—Eighteen plates, viz.: Crabs: Alaska, Kentucky Red, Transcendant, Red Siberian, Hyslop.

Other Varieties.—Fameuse, Buncombe, Tarlton, Maverick, Red Limbertwig, Rawls, Kansas Queen, Simmons, Tallman, Carter's Blue, Yellow Bell Flower.

This is the largest exhibit of apples we have had in several years and your committee would recommend that this industry be carried on on a more extensive scale throughout the State in sections best adapted to this fruit, and would more especially direct attention to the mountainous region, with a view to supplying our local and Southern markets, which are now being furnished by the Eastern and Western growers. This can be done effectually and should receive more attention from the orchardists and prospective fruit growers. The committee are glad to note that some progressive growers are now begining to plant extensive orchards in the Mountain Region.

Figs.—Nine plates, viz.: Golden Narbus, Dalmatian, Madeleine, Celestial, Reed's (Nos. 5 and 6), White Smyrna, White Neyreii, Black Provence.

This shows in a practical way the numerous varieties which can be grown in Middle Georgia and other sections adapted to figs.

Plums.—Ten plates, viz.: Stoddard, Wayland, Beaty, Cluck, Hughes, Forest Rose, Cumberland, Sophie, Indian Red, Wolf.

We note the absence of the usual fine exhibit made of Japanese varieties, but this is presumably attributable to an unfavorable season.

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Peaches.—Twenty-three plates, viz.: Josephine, Crosby, Globe, Tornado, Stonewall, Everbearing, Imperial, Crawford's Late, Druid Hill, Matthews, Doctor Berckmans, Muir, Robert, Sallie Worrell, Amelia, Diamond, Stump, Emma, Oldmixon Cling, Hill's Chili, Indian Blood, Columbia, Seedling Cling (Indian type).

Grapes—Sixty-seven plates, viz.: Cambridge, Venango, Uhland, Delawba, Delaware, Delmerle, Naomi, Amber, Missouri Riesling, Ives, Elvira, Columbian, Elvicand, Pocklington, Esther, Wetumpka, Eva, Linn Queen, Grien's Extra E., Doctor Collier, Brilliant, Munroe, Cunningham, Lincy, Lady Washington, Agawam, Diana, Lightfoot, Triumph, Rochester, Empire State, Noah, Dracut Amber, Canada, Carman, Berckmans, Jefferson, Worden, Diamond, Woodruff, Niagara, Hosford, Cynthiana, Iona, Montefiore, Martha, Etta, Walter, Amethyst, Bokchito, Rentz, Eaton, Captain, Xlenta, Chisholm No. 3, Rommel, Coleraine, Wautumka, Isabella, White Imperial, Bailey, Texas Highland, Bourquiniana.

We note in this exhibit many of Munson's seedlings which are exhibited for variety and test purposes only, none of which are of special mention. Grape nomenclature is already sufficiently confusing. We note a tendency by some growers to prefix the names of new varieties "Dela" as in Delawba and Delmerle, which too closely approximates the old established "Delaware." This exhibit of grapes we commend, but owing to the unfavorable season we find that it is not up to the usual high standard, or so numerous.

Tomatoes.—Six plates, viz.: Ponderosa, Golden Sunrise, Golden Queen, Crimson Cushion, (very large, well meated and good quality.)

Nuts.—Three varieties: Juglans Cordiformis, Juglans Sieboldiana, and Butternut.

C. J. HOOD, HARMONY GROVE.

Peaches.—Seven plates, viz.: Elberta, (good size and quality), Mountain Rose.

W. L. WILLIAMS, HARMONY GROVE.

Peaches.—Five plates, viz.: Chinese Cling, (large size but poor color. Trees evidently must have been too heavily foliaged and very dense or too heavily fertilized with nitrogeneous matter), Yellow Seedling Cling.

P. N. LITTLE, HARMONY GROVE.

Peaches.—Elberta.

Apples.—Equinetelee.

T. C. HARDEMAN, HARMONY GROVE.

Peaches.—Elberta.

N. C. ALEXANDER, HARMONY GROVE.

Peaches.—Elberta.

W. B. J. HARDEMAN, HARMONY GROVE.

Two plates of a late seedling grape (green).

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JOHN M. CARSON, HARMONY GROVE.

Peaches.—Elberta and Champion.
Apples.—Horse.

H. T. SHORE, HARMONY GROVE.

Peaches.—White English seedling cling, (large and showy).

JOHN D. BARNETT, HARMONY GROVE.

Peaches.—Elberta.

J. W. DOWDY, HARMONY GROVE.

Peaches.—Elberta and Burke.

P. E. KEY, HARMONY GROVE.

Peaches.—Elberta.

R. D. COMB, ADAIRSVILLE, GA.

Peaches—Three plates Elberta. (Enormous size, good color and by far the best peaches of this variety exhibited.)

JOHN T. FORT, MT. AIRY, GA.

Peaches.—Two baskets Elbertas.

H. LIGHTFOOT, CHATTANOOGA, TENN.

Apples.—Poorhouse (green and 1-3 size). Committee notes that he says tree is now 40 years old and fruit on same at present time estimated at 25 bushels.

G. M. BOYD, ADAIRSVILLE, GA.

Apples.—Red June Everbearing. (Similar to the well known Red June) —special merit being its long season of maturity.

THE G. M. BACON PECAN CO., DEWITT, GA.

Nuts.—Pecan—number of branches of an unnamed seedling showing its wonderful productiveness. This tree could be used to great advantage in pollenization for cross hybridization. Every terminal showed clusters of from seven to ten nuts.

P. J. BERCKMANS CO., AUGUSTA.

Pears.—Sixteen plates, viz.: Smith's, Garber, Kieffer, Le Conte, Duchesse, Barry, Reliance.

Nuts.—Walnuts: Japan (Sieboldiana and Cordiformis) in both green and matured state; English Walnut (Praeparturiensis or Early Bearing); Pecan: Pride of the Coast (Syn. Rome, Columbian, etc.); Butternut.

The committee commend the efforts of those who have made the exhibition of fruits and nuts interesting and instructive. Exhibitions of this kind have been of incalculable benefit as object lessons in what can be

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accomplished in this State. We regret that all fruit growing sections of the State have not been represented in this exhibit. We would urge that the Society make special efforts another year to induce fruit growers in all sections of the State to attend our meetings and to furnish specimens of all fruits and nuts which have proved successful in their respective localities.

In conclusion, we wish to commend the general exhibit of nuts, an industry which is now in its infancy in this State, and ask the hearty co-operation of this Society and its members in lending their valuable assistance to the "National Nut Growers' Association" which is now doing so much good in developing this new enterprise in our midst.

G. H. MILLER,
CHAS. DECKNER,
JAMES CURETON,
HERBERT C. WHITE,
R. C. BERCKMANS,
C. T. SMITH,
Committee.

This report was received and adopted.

Other Committee Reports.

Committees on New Fruits, on Synonyms, on Ornamental and Useful Trees and on Legislation, had no reports to make.

The Committee on Forestry reported that it would have some papers in the printed copy of the proceedings. This statement, however, it failed to make good.

The Committee on Necrology reported that since the last meeting Mr. J. M. Reynolds, of Mayfield, Ga., and Mr. S. R. Wiley, of Macon, Ga., had died.

On motion the Secretary was instructed to prepare suitable resolutions upon the death of these members, and embrace the same in the proceedings.

ELECTION OF OFFICERS.

President Berckmans then announced that the Vice-Presidents for the 2d, 4th, 6th, 8th, and 10th Congressional Districts go out at this meeting, and their successors would have to be elected. The following gentlemen were elected, all of them

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being re-elected with the exception of Prof. Starnes from the 8th District, who was not eligible for re-election, having removed from the limits of that District:

2d Congressional District, Mr. W. D. HAMMOCK.
4th Congressional District, Mr. HENRY BANKS.
6th Congressional District, Mr. ROBERT E. PARK.
8th Congressional District, Capt. J. B. PARK.
10th Congressional District, Dr. N. McINNES.

Prof. H. N. Starnes was nominated for Secretary, but said he would accept this office only in the event that Prof. Scott should leave the State. Should Prof. Scott remain, and the State be so fortunate as to retain his services as State Entomologist, then it was to be understood that he is re-elected Secretary.

The Society accepted this proviso, and elected Prof. Starnes as the conditional successor of Prof Scott.

Mr. L. A. Berckmans of Augusta, was re-elected Treasurer by acclamation.

President Berckmans in a modest way anounced that he was not a candidate for re-election as President, but the Society would not hear of this, and he was enthusiastically re-elected by a rising vote. Resuming the chair, President Berckmans in a few short sentences expressed his deep appreciation of the confidence displayed in him, and the evidence of esteem and affection shown him and his administration for the past 27 years by the rising vote.

NEXT PLACE OF MEETING.

Col. I. C. Wade then presented the following letter of invitation from the town of Tallulah Falls to hold the next meeting of the Society at that place:

ATHENS, GA., Aug. 4, 1903.

To the Georgia State Horticultural Society.

GENTLEMEN: Representing the Mayor and Council of Tallulah Falls, Ga., and the management of the Tallulah Falls Railway Company, I beg to extend to your Society a most cordial invitation to visit Tallulah Falls during your next session.

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The railroad and hotel facilities are unexcelled, and for the use of such gatherings there has just been completed a splendid auditorium with seating capacity for five hundred or more.

I will be glad to take up the matter of hotel and railroad rates immediately, and advise the committee in charge of these matters of the result of my efforts, thus relieving them, to some extent, of this part of the work. I can, however, assure the Society now that these rates will be most satisfactory.

I would respectfully suggest that, owing to the season of the year when your Society meets, a more fitting place could not be found than this beautiful spot, with its salubrious climate and many other advantages; and these, together with a complimentary trip which the railroad plans to give the members over the line now being constructed through Rabun county and the Valley of the Little Tennessee River, a veritable garden spot, practically unknown to the outside world hitherto, will not only be enjoyed, but, I think, be conducive of a large attendance, which I believe is most desirable.

Respectfully,

W. J. MIDDLETON, Passenger Agent,
Tallulah Falls Railway.

This invitation was accepted and Tallulah Falls designated as the next place of meeting—the date of the session being left, as usual, for the President to determine.

QUESTION BOX.

This was opened and the questions therein read as follows:

QUESTION 1:—*"What is the average cost per tree of spraying?"*

Prof. SCOTT: "The President suggests that I answer this question. The answer depends almost entirely upon the size of the trees and their accessibility, (for example it's much more expensive to spray in North Georgia than in South Georgia, where the land is level, and a wagon can be easily driven between the rows), and it also depends upon the man at the nozzle. The man who does not understand the operation of the nozzle, may waste a great deal more of the mixture than would reach the tree. On an average it will cost about one cent a tree or $10.00 a thousand to spray peach trees with Bordeaux mixture. Crude petroleum can be applied at the rate

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of about $15.00 a thousand. The lime, salt and sulphur wash would be about the same, when we take into consideration the extra cost of preparation."

QUESTION 2:—*"What can we do to rid our cabbage crop of the harlequin cabbage-bug?"*

It was finally agreed than hand-picking was the only way to rid the plants of this pest. Some discussion was had on this question, but it was due to a misunderstanding of the question, and is therefore not here reported.

QUESTION 3:—*"What is the best time to dig for the peach borer?"*

Prof. SCOTT: "I will state in answer to this that it is the usual practice of the best fruit-growers to go over the trees in the fall of the year and take the borers away, and follow that up in the same way in the spring. Col. Fort, I understand, has gone over his orchard lately. If I am correct in this, I would like to hear from him."

Col. FORT: "I have just gone over my orchard, and my reason for going over it at this season of the year is that it is just the time the insect is a crysalis, and just before it becomes a moth."

At this juncture Col. I. C. Wade arose and made the following motion:

In the event the appropriation for a Georgia Exhibit at the World's Fair at St. Louis be made by the General Assembly, and this appropriation is placed at the disposal of the Agricultural Department of this State, I move that a committee be appointed from this Society to co-operate with the State Agricultural Department with the view to having Georgia properly represented at St. Louis next year.

Mr. R. F. Wright, Assistant Commissioner of Agriculture, talked briefly upon this motion, as also did Major Glessner, Prof. Starnes, and Mr. G. H. Miller, all stating that it is eminently proper that Georgia should be properly represented, and expressing themselves as being in favor of the motion.

The motion, when put to a vote, was duly carried.

A second motion was made by Col. Wade (and carried) to the effect that, in the event the Legislature did not make an

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appropriation, the same committee take up the matter of having an exhibit anyhow, and call upon the various agricultural and horticultural interests of the State to come forward, and lend their aid towards creditably representing Georgia at the St. Louis Exposition.

Prof. SCOTT: "I have just received a letter together with a paper on "Marketing Fruit," from Mr. C. W. Withoft, of Fort Valley, Ga., who was prevented from meeting with us. The paper is as follows:

Marketing Fruit.

BY C. W. WITHOFT.

In my few remarks that follow, I only touch part of the most important points, as the rush of the fruit crop is hardly over and it would take several days' hard study to properly cover this important subject.

After we have succeeded in bringing our orchards to a bearing age, we meet a very important problem, to be solved, and that is, marketing our fruits to the best advantage. At the very beginning let us lay down (or rather, hold up continually before us) one most important rule,—it is of great importance to every fruit grower in the State and should be the watchword of our field bosses, our packing house superintendents and every man who has charge of a department in handling fruit. This rule is *"Handle the fruit carefully."* Too much stress cannot be laid on this rule, for it has cost the growers thousands of dollars and often unawares. Some one may say it is not new, but when I see it broken daily, whenever I visit orchards and packing houses and see it sometimes not closely followed in our own orchards and from experience know it must be *strictly adhered to, in order to successfully market* our crop, I say let us enforce it, at any cost. About three weeks ago when the rush was on, I took part of a day and visited several orchards to pick up new ideas, and I was very much impressed with the little attention paid to this rule, especially in the picking gangs. In two of the orchards I saw the picking boss comfortably seated under a tree, while the thoughtless pickers were dropping the fruit into the baskets; the noise sounded like pouring potatoes into a barrel. I know it is a very hard matter to get negro pickers to handle the fruit carefully and a field boss has plenty to do to keep them from picking the fruit too green and to see that they handle it more like eggs than they do potatoes.

We must have organization and system in our orchards and packing houses, have a head for each department, and so arranged that you can keep track of each picker and packer and each overseer. Use tags or cards for both and you will be able to trace the best packers and pickers and will always get after the right one, when the fruit don't come up right.

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It is very difficult in training new packers and pickers to judge marketable fruit from the looks, without "thumbing" it, but this must be done at the very beginning. One "thumbed" peach in a basket may cost us several dollars, as it is sure to rot and then the buyers' confidence is gone, and again this may be one of the sample crates opened to sell more from.

Be sure to have springs on the wagons as it saves many a bruise, and have tarpaulin covers, especially if you haul any distance, as it is a great protection against dust and sun, and when you use every precaution to keep from injuring your fruit, the buyers will stay with you. Show your buyers that you are continually working for their interests; cull your fruit closely and grade it, either by hand or power graders. In a season that is not too wet, the power graders will be found to be labor savers, and by having careful hands run the graders it is very seldom that a peach is damaged in the least. On some of our lighter soils, the Elberta grows to such an even size that it is not necessary to grade, while on a stiff clay land, as a rule, our largest peaches grow and it is necessary to grade them as it pays big and helps build up a reputation.

Now that we have the fruit graded and culled we have another important rule, that is, fill the crates, give the buyers a full package and remember that a full crate carries better than a slack packed one. When a crate is packed the fruit should be about a half inch higher than the ends, so that the lid presses lightly on the top layer; this leaves the crate even full, after it settles.

In loading the cars always get them loaded as quickly as possible and never open the doors any oftener than absolutely necessary, for hot air allowed in a car, after the fruit has been cooled down, injures the fruit seriously.

Never load over four deep in the small series nor over five deep in the large series cars, as the top tiers generally arrive in bad order, when cars are overloaded. It costs us excess freight and refrigeration and we are all hopeful that the "Georgia Fruit Growers Association" will succeed in having the minimum reduced, as it is quite expensive for growers to be forced to pay freights and refrigeration on something they don't ship. Let us all help the Association in the good work. New shippers will find the list of reliable commission houses given out by the Association to be of great help in selecting houses to represent them in the different markets, and at the end of the season if they have complaints and will make them known, giving particulars to the Secretary, the committee will assist them in adjusting claims.

A few words here for organization,—no large fruit section has made much success in marketing their fruit without doing so through organization, and if we would all stand together and market our fruit through an association, it would not be long until we could sell all of our fruit on board cars at loading stations. There is no doubt in my mind, but that the Georgia Fruit Growers' Association was the cause of buyers locating at the loading stations for the past two seasons, with their money right on the ground. We sold over $40,000.00 worth of peaches in the past two

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seasons on track, and I candidly believe that we must thank the Association for it, as the parties to whom we sold had been previously securing fruit on consignment, but fearing they would not get their usual supply, on account of outside buyers coming in, they stepped up and bought.

So I emphatically say, to successfully market our fruits, after they have been very carefully handled, properly packed and loaded, it is necessary for us to stand together, pull together and when we need any changes made or conditions improved, we can do so to a much greater advantage while working together.

President BERCKMANS: "The next thing is to appoint three delegates to meet with the Agricultural Society, representing this Society. I hope we can all attend their meeting, but three must go as delegates anyway. I will name Col. I. C. Wade, Mr. W. D. Hammock, and Mr. Wm. M. Rowland. There are also delegates to be appointed to the American Pomological Society, which meets in Boston in September."

No one responded as willing to go, except President Berckmans himself, who stated that he would endeavor to find someone else to help him represent the Society.

The Committee on Resolutions then offered its report as follows:

Resolved: That the thanks of the Georgia State Horticultural Society are due and hereby tendered the following parties:

1. To the Southern Express Co., and particularly to their local agent at Athens, for their courtesy in transporting without charge the exhibits of the Society and caring for same on arrival.

2. To the Athens Ice & Coal Co. for placing and keeping the exhibits in cold storage.

3. To Messrs. Hugh P. Rowe and T. W. Reed, of the Athens Banner—the former for his courtesy in extending to the Society the use of the Opera House for its meetings, and the latter for many valuable services rendered during the session.

4. To the University of Georgia for its kind invitation to our members to dine at the Denmark Dining Hall, and for the use of the University Chapel for our evening sessions.

5. To the City of Athens and to the management of the Athens Electric Railway Co. for the pleasant trip tendered to and greatly enjoyed by our members on Monday afternoon.

6. To the railroads of the State for the reduced rates given the Society.

H. N. STARNES,
E. B. HEARD,
I. C. WADE,
Committee.

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President BERCKMANS: "I will appoint on the committee to go before the Legislature Messrs. D. M. Hughes, H. A. Mathews, G. M. Ryals, John P. Fort and I. C. Wade."

The Convention was then declared adjourned to meet at Tallulah Falls, Ga., in August, 1904.

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In Memoriam

S. R. Wiley.

Born at Eatonton, Ga., March 1, 1868.
Died at Macon, Ga., September 13, 1902.

Serving as Captain of Co. A, 3d Ga. Volunteers, during the late war with Spain, an eight months' campaign in Cuba so seriously and (as it proved) permanently injured his health, that an active, out-door life became necessary. This induced him to adopt Peach Culture as an occupation, in which employment he was rapidly achieving success.

He is survived by his widow, formerly Miss Julia Gambrell.

J. M. Reynolds

Born near Culverton, Ga., May 18, 1848.
Died near Mayfield, Ga., April 28, 1903.

Farmer, merchant and railroader in early life, he became impressed some years ago with the possibilities of Fruit Growing in Middle Georgia, and has since been one of our most earnest, enthusiastic and successful members—a striking example of what practical business methods, intelligently applied to this industry, can effect.

He leaves, in addition to the many friends who mourn his loss, his widow, formerly Miss Martha C. Allen, and seven children, four of whom are still minors.

To the relatives of both of our deceased brothers the sincerest sympathy of every member of the Society is extended.

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CATALOGUE OF FRUITS.

PLAN OF CATALOGUE.

To enable the Society to publish a full and reliable catalogue of fruits which are successfully cultivated in Georgia, and in view of the vast differences which the climatic influence of the several sections of our State has upon the same fruit cultivated upon the mountains or near the seacoast it has been deemed advisable to divide the State into four distinct sections.

1. The *Upper or Mountain Region,* embracing that section of Georgia between the 34th and 35th degrees of latitude N.

2. The *Middle Region,* between 32d and 34th degrees, including the Southwestern portion of the 32d degree, except the counties named for Southern Region.

3. The *Southern Region,* comprising the counties of Baker, Berrien, Brooks, Charlton, Clinch, Colquitt, Early, Echols, Lowndes, Miller, Mitchell, Pierce, Thomas and Ware.

4. The *Lower or Coast Region,* comprising the counties of Chatham, Bryan, Liberty, McIntosh, Glenn and Camden.

The explanations of the columns will be found under each class of fruits.

The varieties named in the several lists are of recognized good quality, inferior or rejected varieties being omitted.

Synonyms are given in a few instances only where it was deemed necessary; these are placed under the adopted name in *italics.*

One "*" indicates that the varieties succeed well in the region named at the head of column. *Two* "**" indicate the varieties most highly recommended. No "*" indicates no report, or that the variety is not sufficiently tested. A *dash* "—" indicates that the variety is unsuited.

APPLES.

EXPLANATION OF COLUMNS—

Column 1—Name of varieties.

Column 2—Season of maturity.

Column 3—The particular use for which it is best adapted.

Columns 4, 5, 6 and 7—The regions for which the varieties are recommended.

Column 8—Remarks.

EXPLANATION OF ABBREVIATIONS—

Column 2— *Seasons*—S, summer; A, autumn; W, winter; E, early; L, late; E S, early summer; L W, late winter, etc.

Column 3—*Use*—K, designates varieties recommended only for the kitchen or cooking purposes; D, for drying; C, for those specially intended for cider; M, those most valued for market. Varieties not marked may be considered as table or dessert sorts.

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APPLES—Continued.

NAME	Season	Use	Mountain Region	Middle Region	Southern Region	Coast Region	REMARKS
Astrachan Red	ES		**	**	**	*	Profitable early market; very prolific.
Bald Mountain	EW	M	*	..	..	..	
Ben Davis, *syn., New York Pippin*	LW	M	..	**	*	..	Second quality, excellent keeper.
Buncombe, *syn., Meigs' Red Winter Pearmain, Red Fall Pippin*	A	M	*	**	..	..	[bloom buds. Excellent. In some soils liable to blight of
Black Warrior	LW	..	..	**	**	..	Excellent; fine keeper; prolific.
Bonum	A	M	*	*	*	..	An excellent late fall apple.
Carter's Blue, *syn., Lady Fitzpatrick*	A	M	..	*	*	*	Large; sugary; very fine; splendid grower.
Carolina Greening, *syns., Green Crank, Southern Greening, Green Cheese*	W	M	**	**	..	..	Excellent.
Carolina Watson	S	M	*	*	..	..	Very large, prolific; profitable market.
Cullasaga	EW	..	**	*	..	..	Requires strong clay soil.
Chattahoochee	W	..	*	**	..	..	Excellent and fine keeper.
Disharoon	A	..	**	*	..	..	Good quality; fine grower.
Early Harvest	ES	M	**	**	*	*	Universal favorite.
Elgin Pippin	A	M	..	**	..	..	Large and very good.
Equinetelee, *syns., Bachelor, Buckingham, etc*	A	M	**	**	..	*	Very good; needs strong soil; subject to borer.
Etowah, *syn., Cooper's Red*	W	M	**	**	..	**	Very good; fine keeper.
Fall Pippin	A	M	**	*	..	..	Large and very good
Family	S	M	*	**	..	*	Excellent and profitable summer apple; prolific.
Farrar's Summer, *syn., Robinson's Superb*	S	..	**	**	..	..	Very good; lasts from July to October.
Floyd	S	M	*	*	..	..	Ripens from June to September.
Grimes' Golden Pippin	EW	..	**	*	..	..	Very good in Mountain Region.
Gravenstein	ES	..	..	*	**	*	Productive; valuable summer variety.
Heslep	W	..	..	*	..	..	An improved Shockley and better in quality in the Mountain Region.
Hargrove	A	..	..	*	..	..	A showy and excellent new apple.
Homony, *syns., Summer Queen of Kentucky, Sops of Wine*	S	M	**	**	..	*	Excellent; prolific.
Hiley's Eureka	LW	..	..	..	**	..	Late keeper. [two months.
Horse	S	K	**	**	**	*	Superior for cooking and drying; prolific; lasts
Hockett's Sweet	LW	..	..	**	*	..	Prolific and good keeper.
Horn	LW	..	..	**	*	..	Good keeper; open grower.
Julian	S	C	**	**	..	..	Productive; excellent for cider, showy fruit.
Jewett's Best	S	..	..	..	*	..	Very large; very good; stout grower.
Kansas Queen	S	..	..	..	**	..	Very showy; very productive for Middle Region.
Kentucky Red Streak, *syn., Bradford's Best*	A	..	..	..	**	..	Fine grower.
Kinnard	W	M	**	..	..	..	Excellent for mountains.
Lanier	A	M	..	..	*	..	Showy fall apple; good quality.
May Pippin	ES	..	..	*	*	..	Very early; reliable in Middle or Mountain Region
Mamma	A	..	..	*	**	..	Very good; fine tree.
Mangum	W	..	**	**	..	..	Excellent; prolific; subject to moth.
Maverick's Sweet	W	M	..	*	**	..	Very good; good keeper.
Mitchell's Cider	S	C	..	..	..	**	* Promising well; late summer.
Moultrie's *syn., Indian Winter*	LW	M	**	**	..	..	Good and late keeper.
Mrs. Bryan	A	M	**	**	..	..	Showy and excellent. Valuable for market.
Nickajack, *syns., Summerour, Berry, Wonder, etc.*	W	M	..	..	*	..	Excellent in some sections of Middle Region; unreliable; apt to drop before attaining full size.
Oconee Greening	A	..	..	*	*	..	Excellent.
Palmer or Pear Apple	E	..	..	*	**	..	Medium; very good; prolific.
Pine Stump	A	M	..	..	..	..	Promising for Piedmont Region.
Poorhouse	W	..	**	..	..	..	Winter apple of Pippin type.
Romauite	LW	..	**	..	*	..	Good quality; excellent in Mountain Region.
Red Beitigheimer	A	..	..	..	*	..	Promising well.

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APPLES—Continued.

NAME	Season.	Use	Mountain Region	Middle Region	Southern Region	Coast Region	REMARKS
Red June, *syn.*, *Carolina Red June*	ES	M	••	••	••	•	Early; prolific; very good; bears very young; profitable for market.
Rome Beauty	A	M	••	••	....	....	Showy and excellent.
Rhodes' Orange	ES	....	•	••	....	....	Excellent summer fruit.
Simmons' Red	S	K	....	••	....	•	Matures fruit from June to October.
Shockley	LW	M	••	••	••	*	Reliable in every section; profitable.
Sauta	LW	M	•	•	....	•	Very good; late keeper, even on coast.
Summer Cheese	S	K	•	••	....	•	Large; prolific, excellent for cooking and drying.
Summer Queen	S	M	•	••	....	•	Good market apple.
Stevenson's Winter	LW	M	••	••	•	....	Unsurpassed in quality, bearing and keeping.
Striped June, *syn.*, *Early Red Margaret of the South*	ES	M	••	••	....	••	Excellent, fine grower and prolific.
Sweet Bough, *syn.*, *Sweet Harvest*	S	M	••	••	....	•	Very good; early, sweet.
Taunton	A	....	•	••	....	....	Large, showy, good quality, fine for market; open grower.
Terry	LW	M	....	••	....	....	An excellent keeper; resembles Pryor's Red.
Webb's Winter	W	....	••	•	....	....	Good.
White Winter Pearmain	W	....	••	•	....	•	Good.
Wallace Howard	A	M	•	....	....	....	Very showy and excellent.
Wine Sap	LW	M	••	••	....	....	Quality very good.
Yates	LW	C	••	••	....	....	Very good. Small.
Yellow Transparent	E	....	••	••	....	....	variety.
Yopp's Favorite	S	....	•	•	....	....	Very good, prolific, and bears young; desirable

LEADING VIRIETIES OF APPLES FOR MARKET ORCHARDS.

Summer—Astrachan, Red June, Early Harvest, Gravenstein, Family, Striped June, Horse, Julian, Homony.

Autumn—Buncombe, Equinetelee, Rome Beauty, Fall Pippin, Mrs. Bryan, Taunton.

Winter—Black Warrior, Ben Davis, Chattahoochee Greening, Etowah, Hockett's Sweet, Mangum, Romanite, Sauta, Shockley, Stevenson's Winter, Yates.

PEACHES.

EXPLANATION OF COLUMNS.—1st, name of variety; 2d, class—freestone or clingstone; 3d, color of flesh; 4th, season; 5th, use. Remaining columns denote the region, etc.

ABBREVIATIONS.—Class—F, freestone; C, clingstone. Flesh—W, white; Y, yellow; R, red. Season—E, early; VE, very early; M, medium; L, late; VL, very late. Very early, ripens from end of May to June 20th; early, from August 10th to October 1st; very late, from October 1st to November 10th. Use—F, for family use only; M, the most valuable for market; D, the most desirable for drying. Varieties not marked may be considered good for home use.

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PEACHES—Continued.

NAME	Class	Color of Flesh	Season	Use	Mountain Region	Middle Region	Southern Region	Coast Region	REMARKS
Alexander, *syn. Amsden*	F	W	V E	M	*	*	*	*	Quality good; bright color; still profitable in some sections.
Amelia, *syn., Stroman's Carolina*	F	W	E	F	*	**	*	**	Very large; very good.
Austin	C	W	V L		**	**			Excellent October cling.
Berenice	F	Y	L	MF	**	**			Large, showy, excellent.
Bustian's October	C	W	V L	M	**	*			An excellent very late cling.
Baldwin's Late	F	W	V L		**	**			Good late freestone.
Belle	F	W	M	M	**	**	*		Of Chinese type and earlier than Elberta.
Brandywine	F	Y	M	M	*		*		For home market.
Carman	F	W	V E	M	**	**			Bears early, prolific.
Champion	F	W	E	M		**			
Chinese Cling	C	W	E	M	*	*	*	*	Excellent and large; subject to rot.
Church	F	W	L	M	**	**			Very good September freestone.
Columbia, *Syns., Indian, Pace, et c*	F	Y	M	MD	*	*		*	Excellent for all purposes.
Crawford's Early	F	Y	E	M	*	*	*	*	Very good and standard market variety.
Crawford's Late	F	Y	M	M	*	*	*	*	Variable; rots in some seasons.
Darby	C	W	V L	M	**	**			An excellent October cling.
Demming's Sept	C	Y	L		*	*			Similar to Lemon cling; ripens one month later.
Duff Yellow	C	Y	E	M		**			Very large, early; second quality.
Early Tillotson	F	R	V E	M	**	**	*	*	Very desirable.
Eaton's Golden	C	Y	L	D	**	*			Superior cling for preserving.
Elberta	F	Y	M	M	**	**	**	**	Very large and handsome; standard market variety.
Emma	F	Y	L	M	*	*			Follows Elberta; excellent.
Everbearing	F	W	E & L	F		**	*		Excellent for family use.
Flewellen	C	R	E			*			Good early cling of Indian type.
Fleitas St. John, *syn., May Beauty*	F	Y	V E	M		**	*	*	Very good, early; excellent market variety.
Ford's	F	W	V E	M		*			Large, very early, promising.
Fostter	F	Y	V E	M		**			Earlier than Early Crawford.
Goode's October	C	R	V L		*	*			Very good late Indian cling.
General Taylor	C	R	V E	M	*	**			Very good early cling.
Greensboro	F	W	V E	M	**	**	*		Quality very good.
Heath White, *syn., White English*	C	W	L	M	**	**	*	*	Excellent for preserving and market.
Hiley's or Early Belle	F	W	V E	M		**			Improvement on Tillotson.
Indian Blood Cling	C	R	M	F	**	*	*		Very juicy and good.
Lady Ingold	F	Y	E	M		*			Excellent, earlier than Early Crawford.
Lemon Cling, *syn., Pineapple*	C	Y	M	M	**	**	*		Superior cling.
Louise	F	W	V E	F		**			Very good; ripens ten days after Alexander.
Mamie Ross	F	W				*			Promising market variety.
Mountain Rose	**F**	**W**	**M**	**M**	*	**	**	**	**Superior to Early York.**
Muscogee	**F**	**W**	**M**	**F**		**			**White-fleshed Columbia; good.**
Newington Cling	**C**	**W**	**M**		*	*			
Osceola	**F**	**Y**	**L**		*	*			**Good freestone of Indian type.**
Oldmixon Free	**F**	**W**	**M**	**F**	**	**		*	**Excellent family variety.**
Oldmixon Cling	**C**	**W**	**M**	**F**	**	**		*	**Excellent family variety.**
Oriole	**C**	**Y**	**M**	**M**	*	**			**One of the best yellow July clings.**
Plant	**C**	**Y**	**M**	**M**	*	**			**Large, showy. August.**
Picquet's Late	**F**	**Y**	**L**	**MD**	**	**	*	*	**Best freestone of its season.**
Red River	**F**	**W**	**V E**	**M**		*			**Excellent market variety.**
R. E. Lee	**C**	**W**	**E**	**M**	**	**	**	**	**Earlier than its parent, Chinese cling.**
Rivers	**F**	**W**	**V E**	**F**	**	**	*	**	**Of best quality, large size; too tender for market.**
Salway	**F**	**Y**	**L**	**M**		*			
Sneed	**F**	**W**	**V E**	**M**	*	*			**Promising as a very early shipping variety.**
Stump the World	**F**	**W**	**M**	**M**	**	**	*		**Superior market variety.**
Susquehannah	**F**	**Y**	**M**	**M**	**	*			**Very large; superior to Late Crawford.**
Scott's October	**C**	**Y**	**V L**		*	*			**Good late cling.**
Stinson's October	**C**	**W**	**V L**		*	**			**Good late market variety.**
Thurber	**F**	**W**	**M**	**F**	*	**	**	*	**Very large, best quality.**
Tinsley's Oct. Cling	**C**	**W**	**V L**		*	**			**Good late cling.**
Tuskena	**C**	**Y**	**V E**	**F**	**	**		*	**Similar to Lemon cling. June.**
Waddell	**C**	**W**	**V E**	**M**	*	**			**Better than Carman.**

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PEACHES—Continued.

LEADING VARIETIES IN ORDER OF MATURITY FOR FAMILY USE OR HOME MARKET.

Greensboro, Waddell, Red River, Hiley, Belle, Thurber, Sneed, Alexander, Louise, Tillotson, Fleitas St. John, Carman, Tuskena, Mountain Rose, Lady Ingold, Early Crawford, Gen. Lee, Chinese Cling, Oldmixon Free, Susquehannah, Elberta, Emma, Stump the World, Columbia, Lemon Cling, Muscogee, Indian Blood Cling, Picquet's, White Heath Cling, Eaton's Golden, Baldwin's, Austin, Darby, Bustian's, Stinson's.

LEADING VARIETIES FOR SHIPPING TO NORTHERN AND WESTERN MARKETS.

Greensboro, Red River, Fleitas St. John, Tillotson, Waddell, Carman, Hiley, Belle, Crawford's Early, Crawford's Late, Mountain Rose, Stump the World, Thurber, Elberta, Emma.

NECTARINES.

Boston, Downton, Early Newington, Early Scarlet, Early Violet, Elruge, Golden Cling, Hardewick, Hunt's Tawny, New White, Red Roman, Stanwick, Victoria.

Reports from every section state this fruit to be unreliable, owing to attacks of the curculio, and, unless carefully sprayed, is unproductive.

APRICOTS.

Explanations and abbreviations same as Peaches.

NAME	Class	Color of flesh	Season	Use	Mountain Region	Middle Region	Southern Region	Coast Region	REMARKS
Breda	F	Y	E	....	..	*	*	....	....	Trees are liable to be killed by spring frost. Only desirable for city gardens or where protected by surrounding buildings.
Early Golden	F	Y	E	....	..	*	*	....	....	
Hemskirke	F	R	M	....	....	....	....	....	
Kaisha	F	Y	M	....	....	....	....	....	
Large Early	F	Y R	E	....	....	....	....	....	
Large Red	F	R	M	....	....	....	....	....	
Moorpark	F	Y	L	....	....	....	*	....	
Orange	C	Y	M	....	....	....	....	....	
Peach	F	Y	M	....	....	....	*	....	
Royal	F	Y R	M	....	....	....	*	....	
St. Ambrose	F	Y R	M	....	....	....	....	....	
Turkey	F	Y	L	....	....	....	....	....	

POMEGRANATES.

NAME	Mountain Region	Middle Region	Southern Region	Coast Region	REMARKS
Acid	....	**	*	**	
Dwarf	....	....	....	....	Suitable for pot culture
Large Sweet	....	**	*	**	The climate of Mountain Region is to cold to grow this plant.

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NUTS.

WALNUTS.

English: (Juglans Regia)—The most suitable soils are calcareous, clay, loam, gravelly or stony, naturally well drained; stiff clays, retentive of humidity, are unsuited.

Common—This is the typical variety from which are derived the following forms or sub-varieties:

Chaberte—Nut oval, medium, full kernel, rich in oil, blooms late, and therefore suited to localities liable to late spring frosts.

Early Bearing (Praeparturiensis)—Nuts medium, nearly round, good quality. The tree is remarkably prolific and begins to yield fruit at from four to five years from seed. Half hard shell.

Franquette—Large, oblong, pointed, full kernel, half hard shell.

Mayette—Nuts produced in pairs, half hard shell, full kernel, excellent quality.

Parisienne—Large, oblong, half hard and rough shell, kernel scarcely filling the shell. Very prolific and of good quality.

St. John—Nuts medium, hard shell, good quality. Blooms latest of all, and valuable where late springs prevail.

Thin Shelled—Nuts large, oblong, very thin shell, of excellent quality and the standard dessert variety. Keeps sweet a long time. Its shell is liable to be crushed when roughly handled.

Barthere—Nut very long, half hard shell, full kernel.

Ailantus Leaved—Fruit produced in pendulous clusters, wholly of ornamental value.

Cut Leaved—Leaves deeply lasciniated. Nuts medium, of good quality.

Long Beaked—Fruit with a long beak. Of no special commercial value.

Walnut, Japan—(Juglans Seiboldii)—Nuts produced in clusters of six to twelve, of medium size, pointed, shell very hard, kernel very sweet, prolific and bears fruit when trees are four to six years old.

Walnut, American Black—(Juglans Nigra)—Fruit large, very hard shell, kernel sweet. Doubtless susceptible of producing improved varieties by judicious selection. Timber valuable for cabinet work.

Walnut, Ashy Grey or Butter Nut—(Juglans Cinerea—)Mountain districts, nut large, hard shell. May be improved under cultivation. The timber is valuable for cabinet work.

PECANS.

(Carya Olivaeformis)—Succeed in almost any soil, but best in rich alluvial or river bottoms. Hardy from Texas to Nebraska.

Nuts vary in size and shape, from the very hard shelled nuts to the very thin paper shell, which sometimes attain two and a half inches in length. Forms reproduce themselves from seed with some variation, the average of self-reproduction being about fifty per cent.

Louisiana and Texas Paper Shell command the highest market prices. In shape they vary from two and a half inches long by three-quarters to one inch in diameter to other shapes approaching to the more globular, but

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the distinctive characteristics are the more or less thin shell, which is well filled by a sweet and well flavored kernel. Some forms of the paper shell class are known unler local names, such as Turkey Egg, Mexican, Stuart, Centennial, Colorado, Pride of the Coast, etc.

Hard-Shell Pecans vary in size and shape of nuts, the larger forms being two inches by three-quarters, and many are of excellent quality, but as a commercial commodity do not command the high prices of the former.

NOTE.—The impression prevails that whenever the tap root is cut in transplanting the tree never bears fruit. This is a ridiculous assertion, and is misleading as it is contrary to all past experience, because of the fact that most of the thousands of bearing Pecan trees found throughout the State had their tap root sometimes reduced to a few inches in length.

CHESTNUTS.

American (Castanea Americana)—Nuts of medium size, usually three in a burr, the middle one flattened and sometimes imperfect, the outer ones plano-convex; flavor sweet; succeeds in almost any soil not too moist, but thrives best in rich, clayey or rocky soils in the upland districts. Several forms have been produced by careful selection of the largest nuts. The most conspicuous being Paragon and Numbo, both producing nuts of very large size and excellent flavor.

Chincapin (Castanea pumila)—Nuts small, solitary in burr, flavor sweet A small tree or large shrub, succeeding in much lower sections of the State than the chestnut. No improved forms are recorded.

European (Castanea vesca)—In each country in Europe are found forms which seem specially adapted thereto and known mainly under local names. The following may be classed as principal varieties and known as commercial sorts:

Ordinary—Nuts medium, very productive, usually propagated from seed and the varieties known as European or Spanish.

Exalade—Nuts large and considered of the best quality; tree rather dwarf and productive.

Pourtalonne—Nuts very large.

Green of Louisiana—Large, and keeps sweet a long time.

Combale—Nut very large and trees very productive.

Nouzillarde—Very large and requires a warm soil and section.

Lyons, Luc, Lusignan, d'Agen, etc., are names given to the large nuts usually found in commerce.

Identical reproduction by seed is unreliable; fifty per cent. may be taken as a fair average. The best varieties are increased by grafting.

Japan—This is a distinct type, resembling the European more closely than the American and contains many forms. Nuts grown upon seedling trees vary remarkably in size and quality, some being scarcely as large as the American sweet chestnut, whereas others are larger than any of the European sorts. Hence the best forms can only be reliably propagated by grafting. The word Mammoth can not always be applied to seedlings, because of the great variation in size.

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The true Mammoth as produced upon grafted trees, is of very large size, sometimes attaining one and three-quarters by one and one-half inches. Flavor sweet but inferior to the European sorts. Burrs often producing four to five nuts, and occasionally as many as seven. Trees are very dwarf growth, and begin to bear fruit at two years from graft, but seem to be short lived.

ALMONDS.

As a rule unsuited to the State of Georgia owing to fruit blooms being injured by spring frosts. Occasionally successful in the Coast and Southern regions.

Hard Shell—This section comprises several varieties with sweet and bitter kernels. The latter resist spring frost better than the sweet varieties and often yield good crops of nuts, which are, however, of little value for culinary purposes. Where successful, the following sub-varieties produce sweet nuts: Ordinary, Large Green, Half Hard Shell, all sweet nuts; Matherone, Moliere, Pistache.

Soft or Paper Shell, Princess, Sultana, Heterophylle—This is the most esteemed for using in a fresh state. Peach Almond, a variety with occasionally a fresh hull, in this resembling a peach. Of little value as a fruit.

FILBERTS.

(Corylus avellana.)

These are divided into two classes: 1. Filberts, or with long husks. 2. Hazelnuts, or with short husks. These plants thrive best in light but rich soils, and not too dry. Plants must be trained to single stems and very low heads, all suckers carefully removed. The best varieties are Cosford, Kentish Cob, Lombard, Purple Filbert, White Filbert.

PEARS.

EXPLANATION OF COLUMNS—1st, name of variety; 2d, season; 3d, use; 4th, stock upon which the variety succeeds best; remainder, the region in which the varieties are recommended.

ABBREVIATIONS—Season and Use, same as those for Apples. Stock—Q, quince; S, pear stock. Where not marked, the varieties thrive equally upon quince or pear.

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PEARS—Continued.

NAME	Season	Use	Stock	Mountain Region	Middle Region	Southern Region	Coast Region	REMARKS
Barlett	S	M	S	**	**	...	**	Good everywhere, but subject to blight.
Belle Lucrative	S	...	S	**	**	...	*	Good for family use.
Beurre Bosc	A	...	S	*	*	...	...	Variable as to soil.
Beurre Clairgeau	A	...	S	*	*	...	**	Apt to lose its folage.
Beurre d'Anjou	S	M	Q	**	**	...	*	Very good.
Beurre Diel	S	...	...	*	*	...	...	Good.
Beurre Easter	W	...	S	**	*	...	...	A late keeper.
Beurre Giffard	ES	...	Q	**	**	...	*	Very early; open growth.
Beurre Langelier	A	...	...	**	*	...	...	Very fine in Mountain Region.
Beurre Superfin	S	M	...	**	**	...	*	Excellent, but rots at the core.
Clapp's Favorite	S	M	S	*	**	...	*	Very good; fine color; matures rapidly; standard
Doyenne d'Ete	ES	...	...	*	**	...	*	Good; very early but small. [only.
Doyonne Boussock	S	...	S	*	*	...	...	Slow bearer.
Duchesse d'Angouleme	S	M	Q	**	**	...	**	most profitable of all on quince.
Flemish Beauty	S	M	S	*	**	...	**	Good, but liable to rot at core.
Garber	S	M	S	*	**	*	*	Oriental type, good; follows Leconte.
Howell	S	M	...	**	**	*	**	Very good.
Kieffer	A	M	S	**	**	**	**	Productive and valuable as a late pear.
Lawrence	S	M	S	*	**	...	*	Large and fine; fine grower; best on standard.
Louise Bonne de Jersey	S	...	...	*	...	...	*	Variable as to quality.
Leconte, *syn.*, *Chinese Pear*	S	M	S	**	**	**	**	Valuable in South Georgia; very good for table
Mikado	S	...	S	...	...	...	...	Good for canning. [and market.
Mme. Von Seibold	A	...	S	...	...	...	...	Good for canning.
Onondaga	ES	M	S	**	**	...	...	Vigorous grower; good quality.
Osband's Summer	S	...	...	*	*	...	...	
Ott	VE	...	...	*	*	...	...	Small, but excellent and productive.
Petite Marguerite	S	...	...	**	**	...	...	Seedling of Doyenne d'Ete, and better.
Reliance	S	...	S	...	...	...	...	Excellent quality; reliable bearer.
St. Michael Archangel	S	...	...	**	**	**	**	Fine grower; good fruit.
Seckel	S	M	Q	**	**	*	*	Slow bearer; fruit best quality.
Stevens' Genesee	S	...	...	*	*	...	...	
Smith's	VT	...	S	*	*	...	...	Oriental type; resembles LeConte, but little
Wilder	...	T	S	**	*	...	...	Showy, small, good, but slow bearer. [earlier.

BEST VARIETIES FOR MARKET IN ORDER OF MATURITY.

ON QUINCE—Beurre Giffard, St. Michael Archangel, Beurre Superfin, Howell, Duchesse d'Angouleme, Seckel, Beurre d'Anjou.

ON STANDARD—Doyenne d'Ete, Clapp's Favorite, Bartlett, Belle Lucrative, LeConte, Flemish Beauty, Beurre Clairgeau, Lawrence, Kieffer, Beurre Easter and Winter Nelis.

ORIENTAL TYPE—Mikado, Garber, Mme. Von Seibold. Very productive and valuable for canning and evaporating only.

PLUMS.

EXPLANATION OF COLUMNS—1st, name of variety; 2d, color; 3d, class—whether free or clingstone; 4th, season; remainder, region in which the varieties are recommended.

ABBREVIATIONS—Color—R, red; Y, yellow; B, blue; G, green, P, purple. Season—As for Peaches. Class—C, clingstone; F, freestone.

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NAME	Color	Class	Season	Mountain Region	Middle Region	Southern Region	Coast Region	REMARKS
Type Americana or Peach-Leaved:								
Harper's	R	C	M	*	*	**		
Kanawha	R	C	L		*			Very late; prolific, must ripen upon the tree.
Miner	R	C	M		*			Promising well.
Type Chickasaw:								
Cumberland	Y	C	L		**			Prolific, and of good quality.
Hughes	R	C	M		*			Good quality; prolific bearer.
Missouri	R	C	L		**			Grows in clusters.
Pottawottamie	R	C	M					Follows Wild Goose.
Robinson	R	C	M		**			
Wild Goose	R	C	E	**	**	*		
Supposed Cross:								
De Caradeuc	Y R	C	E	*	*		**	Most profitable for shipping.
Type European:								
Bradshaw	R	F	M					
Coe's Golden Drop	Y	C	M	*	*			
Columbia	P	F	M					The Curculio prevents this class of plums from being raised to any extent. Where special care is taken to destroy the insects, the varieties marked * are recommended.
Damson, *syn., Black*	B	F	E	**	**			
Duane's Purple	P	C	M	*	*			
Green Gage	G	F	M	*	*			
Imperial Gage	G	F	M		*			
Lombard	P	C	M	*	*			
Mogul, *syn., Morocco*	B	C	M		*			
Monroe	G		M		*			
Moore's (Arctic)	P		M	*				Good quality in mountains.
Orleans (Smith's)	P	F	M					
Red Gage	**P**	**F**	**M**	*	**			
Shipper's Pride	**P**		**M**	*				
Washington	**Y**	**F**	**M**		*			
Yellow Gage	**Y**	**F**			*			Profuse bearer.

JAPANESE PLUMS.

Prunus Triflora of Botanists—Prunus Japonica of Pomologists.

For many years past efforts have been made to simplify their nomenclature and remove the perplexing synonymy resulting from the Japanese names, which usually refer to a class or type or the locality from which trees are exported, and have resulted in the confusion which has existed in their nomenclature. Specific names have lately been adopted by leading American Pomologists, and plums disseminated under these.

HATTANKIO GROUP.

As the varieties of this group appear to be less hardy in the Northern States, we would recommend these for sections below the thirty-fourth degree of latitude north.

Georgeson or Hattankio No 1—Usually round, 1 1-4 to 1 1-2 inches in diameter, clear gold or yellow; flesh firm, yellow, sweet, and gage flavor; clingstone. July 1st to 10th, or two weeks later than Kerr.

Kerr or Hattankio No. 2— Variable in shape, usually pointed, 1 3-4 by 1 1-2 inches, but perfectly round specimens are often produced upon the

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same tree. The pointed form is the Hattankio-Togari (Togari means pointed); the round form is sometimes called Hattankio-Maru (Maru means round). Skin bright yellow, flesh yellow, juicy, sub-acid, gage flavor; quality very good. Clingstone. Maturity from June 10 to 20. Very prolific, and an excellent early market as well as dessert fruit.

Kelsey—This is the most remarkable variety of this section. It sustains every point of excellence claimed for it by the introducers. Size large to very large, often 7 to 9 inches in circumference; heart shape; color greenish yellow, rich and juicy, and with excellent flavor; pit very small, adheres slightly to the flesh. For canning or evaporating it is also most valuable. Experiments resulted in yielding 19 1-2 pounds of dried fruit to 100 pounds of fresh fruit. Maturity middle of July to end of August.

The fruit decays to some extent during the rainy seasons of July. This is more apparent where trees are kept cultivated after the middle of June. Upon clay soils, and where the surface is left undisturbed a month or six weeks before maturity, the fruit is usually entirely free from decay, and keeps sound until the middle of September.

SMOMO GROUP.

This type seems to belong to the hardier or Northern group, and has given good results nearly everywhere.

Abundance or Yellow Fleshed Botan—Round with pointed apex, but varies from quite round to sharply pointed. Skin yellow ground, heavily washed purple carmine and a darker cheek. Flesh yellow, very juicy, sub-acid, with apricot flavor; quite firm; skin tough; clingstone; quality best; pit large. Maturity June 25 to July 5. One of the best early varieties and carries well to distant markets.

It is the most desirable for shipping North and West. Fruit should be thinned, otherwise the size is reduced and quality inferior.

Berckmans or Sweet Botan—Large, obtusely conical, green, nearly covered with dull purple; flesh firm, yellowish, somewhat coarse, and of second quality; freestone. Ripens from June 15 to July 15; very productive.

Although possessing some merits, it is inferior in quality to the yellow fleshed Botan, but this variety seems to be one of the most desirable for upper sections, where its quality improves.

Burbank—In general characteristics resembles Abundance or Yellow Fleshed Botan. Color cherry red, mottled yellow; shape usually more globular; flesh, flavor and quality are identical, but its period of maturity here is from two to three weeks later, or middle to last of July. The tree is of very vigorous habit, differing in foliage and growth. Valuable for shipping and follows Abundance.

Chabot—2 1-2 inches long by 2 inches broad; yellow ground nearly covered with carmine red, flesh orange yellow, very solid, sub-acid; quality very good; clingstone. Maturity end of July. This is identical with Bailey and Normand.

Hatan Kayo (Douglas and Munson in Prof. Bailey's Bulletins.) Medium to large, slightly pointed, bright vermillion, sub acid; excellent, cling, middle to end of July.

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Maru—Of medium size, slightly pointed, light red; flesh yellowish, melting, juicy, sub-acid; nearly freestone; second quality, but showy. Maturity end of June. Not desirable for the extreme South, but it is hardier in bud than any other Japanese plum tested.

Ogon, Shiro-Smomo, or the White Plum—Medium to large, round, golden yellow; flesh yellow, firm, sub-acid, quality good; freestone. June 15, tree of vigorous growth. A good cooking fruit.

Red Nagate, or Red June, or Long Fruit—1 3-4 by 1 1-2 inches, pointed, skin thick, purplish red, with blue bloom. Flesh yellow, solid, somewhat coarse grained; juicy, sub-acid with Damson flavor; clingstone; quality good. Maturity middle to end of June. Very prolific, showy and good; very early market variety.

UCHI-BENI, OR BENI-SMOMO GROUP.

(Or Red Fleshed.)

Satsuma or Blood Plum—Synonym: Yonemomo. Large, skin dark purplish red, mottled, with bluish bloom; shape globular or with sharp point, flesh firm, juicy, dark red or blood color; well flavored, firm; quality very good, pit small. Maturity middle of July; tree very vigorous. One of the most valuable varieties of this section for canning.

CROSS-BRED VARIETIES.

America—Very promising.

Doris—Very promising.

Hale (from Luther Burbank, Santa Rosa, California)—Large, round, cordate, orange, mottled red; flesh yellow, soft, juicy; slightly acid, cling; end of July; very good to best; not productive.

Wickson (from Luther Burkank—Kelsey Satsuma)—Very large, obconical, pale yellow, but gradually assuming a deeper color which is almost dark red at full maturity. Flesh yellow, solid, very rich, sweet, cling and well flavored, quality best, middle to end of July, very prolific.

PRUNUS SIMONI.

(Simon's Chinese Apricot Plum.)

A remarkable fruit indeed. This was introduced 24 years ago from China. The tree is of attractive, erect and compact habit; flowers very small; fruit large, flattened, 2 1-2 by 2 3-4 inches broad, by 1 1-2 to 2 inches through, resembling a ripe tomato; flesh yellow, fine grained and firm; juicy, sub-acid and with a remarkable combination of flavors, such as pear, pineapple and muskmelon; quality best; begins to ripen June 15 and lasts one month. The tree is a shy bearer, but in favorable seasons produces a heavy crop of fruit, which always brings a high price.

PERSIAN PURPLE-LEAVED OR PRUNUS PISSARDII.

(Prunus Mirabolana Type.)

Fruit medium, dark purple, flesh deep red, juicy, sub-acid. Ripens end of May; a good cooking fruit. Foliage deep purplish red, retained throughout our warmest weather and until mid-winter. Its great value is as an ornamental tree.

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NATIVE GRAPES.

EXPLANATION OF COLUMNS—1st, name; 2d, variety; 3d, season; 4th, use; remaining columns for regions, etc.

ABBREVIATIONS—Color—W, white; B, blue or black; R, red; PB, pale blue. Season—E, early, maturing from beginnig to end of July; M, medium, maturing from end of July to August 15; L, late, maturing afer middle of August; VL, very late, maturing after middle of September. Use—M, market; T, table; W, wine.

NAME	Color	Season	Use	Mountain Region	Middle Region	Southern Region	Coast Region	REMARKS
Type Labrusca (or Fox Grape.)								[ing its old standard.
Catawba	R	M	W	*	*	•	....	Less liable to rot than formerly; regain-
Concord	B	M	MW	**	**	••	••	Among our best varieties.
Diana	PR	M	TM	*	**	....	•	Good quality; good bearer and shipper.
Hartford	B	E	M	*	**	•	•	Good early variety for market.
Ives	B	M	WM	**	**	••	••	Prolific and no rot.
Moore's	B	E	M	*	*	....	....	An early shipper.
Niagara	W	M	M	**	**	••	•	Profitable as a white market grape.
Perkins	R	E	M	*	**	....	•	Good bearer; no rot; second quality.
Worden	B	M	M	*	**	....	....	Larger than Concord.
Labrusca Hybrids:								
Barry (Rogers' 42)	B	M	T	....	*	....	....	
Brighton	R	E	T	**	*	....	....	Very good quality; good bearer.
Diamond	W	VE	TM	*	**	....	....	Very early; white.
Duchess	W	E	T	....	..	....	....	1st quality; liable to rot; requires sacking.
Empire State	W	M	T	*	*	....	....	Unreliable in some soils.
Goethe (Rogers' 1)	PR	L	TW	*	**	....	•	Good; late; requires sacking.
Lady Washington	W	M	T	*	*	....	....	Moderate grower.
Lindley (Rogers' 9)	R	M	T	....	*	....	....	Good.
Merrimac (Rogers' 19)	B	M	T	*	*	....	*	Suitable for amateur culture.
Peter Wylie	W	M	T	*	*	....	....	Best quality.
Salem (Rogers' 53)	R	M	M	*	*	....	....	Good.
Wilder (Rogers' 4)	B	M	T	*	*	....	•	
Type Aestivalis, (Summer Grape):								
Carman	B	M	TM	....	*	....	....	Very showy and good.
Cunningham—*Syn.* Long	PB	M	W	*	*	....	....	Good but not productive.
Devereaux—*syn.* Black July	B	M	TW	....	**	....	•	Excellent; shy bearer while young.
Herbemont—*Syn.* Warren	PB	L	W	*	*	....	••	Apt to rot; excellent quality.
Lenoir	B	M	W	*	*	•	•	Rots in Middle region; excellent for wine.
Norton's Virginia	B	L	W	**	**	....	••	Best for red wine.
Aestivalis Hybrids:								
Delaware	PR	E	TMW	**	**	••	••	Best table variety; reliable; slow grower.
Type Riparia (or Riverside Grape):								
Clinton	B	M	W	*	*	....	•	Good for red wine.
Riparia Hybrids:								
Bell	W	M	T	....	*	....	....	
Berckmans	R	M	T	*	**	....	....	Vigorous; better grower than Delaware.
Canada	B	E	T	....	*	....	....	Good table grape.
Elvira	W	M	W	*	*	....	....	Reliable in upper Middle region.
Missouri Riesling	W	M	TW	....	**	....	....	Good for white wine.
Noah	W	M	W	....	*	....	....	For white wine.

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GRAPES—Continued.

NAME	Color	Season	Use	Mountain Region	Middle Region	Southern Region	Coast Region	REMARKS
Type Rotundifolia, (Muscadine):								
Flowers	B	VL	W	*	*	*	**	The latest of the type.
James	B	L	TW	....	*	....	....	Very large berry.
Scuppernong	W	L	TW	**	**	**	**	Most certain bearer; good wine grape.
Tenderpulp	B	L	TW	*	*	*	*	Pulp dissolving.
Thomas	PB	E	TW	**	**	**	**	An excellent early variety.
Type Vinifera, (European Grape):								
Welcome	B	M	T	....	**	....	....	Excellent quality.

BEST VARIETIES FOR MARKET IN ORDER OF MATURITY.

Diamond, Moore's, Brighton, Ives, Delaware, Niagara, Concord, Perkins, Diana.

BEST VARIETIES FOR WINE.

Red—Norton's Virginia, Lenoir, Clinton, Concord, Ives, Thomas.

White—Missouri Riesling, Catawba, Delaware, Elvira, Warren, Noah, Scuppernong.

STRAWBERRIES.

EXPLANATION OF COLUMNS—1st, name; 2d, sex; 3d, origin; 4th, use; 5th, season.

ABBREVIATIONS—Sex—P, Pistillate; all others are hermaphrodite. Origin—F, Foreign; A, American. Use—F, family; M, market. Season—E, early; VE, very early; L, late.

NAME	Sex	Origin	Use	Season	Mountain Region	Middle Region	Southern Region	Coast Region	REMARKS
Bederwood	....	....	....	....	....	*	....	....	
Belmont	H	A	F	....	....	*	....	....	Large; suitable for rich soils.
Brandywine	....	....	....	....	*	*	*	....	
Bubach	P	A	M	....	**	**	....	....	Excellent.
Cumberland	H	A	M	M	....	**	....	....	
Excelsior	....	....	....	....	....	....	....	....	
Greenville	....	....	....	....	....	*	....	....	
Gandy	H	A	F	M	....	**	....	....	
Haverland	H	A	F	M	*	**	....	....	Productive; large.
Hoffman	H	A	M	VE	....	**	*	**	Best early shipper.
Lady Thompson	....	....	....	....	**	**	**	**	Best market variety.
Michel	H	A	M	VE	*	*	....	....	Very early and good quality.
Sample	....	....	....	....	....	....	....	....	
Sharpless	H	A	M	L	**	**	....	....	Size large and quality good.
Wilson's Albany	H	A	M	E&L	*	**	**	**	Best; every report favorable.

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RASPBERRIES.

NAME	Mountain Region	Middle Region	Southern Region	Coast Region	REMARKS
Class I.—Cap Varieties					
Gregg	*	**	....	....	Best of the black caps.
Schaffer's	*	**	....	....	Late, productive; good shipper.
Souhegan	*	**	....	....	Very early.
Class II.—American Red Varieties.					
Cuthbert, or Queen of the Market	**	**	....	....	Best and most reliable.
Reliance	*	**	....	....	Good.
Turner	*	....	....	....	A promising variety.
Class III.—Hybrid of Foreign and American Red.					
Caroline	....	*	....	....	Good; yellow; productive.
Golden Queen	*	*	....	....	Productive in new land.
Loudon	**	**	....	....	

BLACKBERRIES.

Austin's Improved or Maye's Hybrid	....	**	....	....	A large Dewberry.
Dallas	....	*	....	....	Early, promising.
Early Cluster	....	*	....	....	
Erie	....	....	....	....	
Early Harvest	....	**	....	*	Valuable as a very early berry.
Kittatinny	....	**	....	....	
Ohmer	....	*	....	....	Late.
Taylor's Prolific	....	*	....	....	
Trinity	....	*	....	....	Very early, 10 days ahead of Early Harvest.
Wilson's	....	**	....	....	

MULBERRIES.

Downing's	....	**	**	**	Good flavor, acid; moderate bearer.
Hicks'	....	**	**	**	Inferior fruit; very prolific, recommended for poultry and hogs.
Stubbs'	**	**	*	*	Large; very best; immensely productive.

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FIGS.

EXPLANATION OF COLUMNS—1st, name; 2d, size; 3d, color; 4th, season; remaining columns for regions, etc.

ABBREVIATIONS—Size—S, small; L, large; M, medium. Color—W, white. Season—E, early; M, middle season; E and L, early and late.

NAME	Size	Color	Season	Mountain Region	Middle Region	Southern Region	Coast Region	REMARKS
				Require Protection				
Angelique, *syn.*, *Early Lemon*	S	W	E		•	....	....	Small; good; early.
Brunswick, *syns.*, *Madonna, Con'sple*	L	P	E&L	••	••	•	....	Very large and desirable.
Black Genoa	M	P	M		••	....	....	
Black Ischia	M	P	M		••	....	•	Good.
Brown Turkey	M	B	E&L		••	••	••	Best of all for Middle region.
Brown Smyrna	M	B	M		•	....	•	Very good and prolific.
Celestial	S	V	M		••	••	••	Small; prolific and desirable.
Green Ischia, *syns.*, *White Ischia, Green Italian*	M	G	M L	••	....	•	••	Very good.
Japan	....	....	....		....	....	....	
Lemon	M	V	M		....	....	•	Good.
Neyreii	S	W	L		••	....	•	Good.
Marseilles	M	W	M		•	....	•	Rather dry, but prolific.
Violet Round	M	W	M		•	....	•	

CHERRIES.

Explanations and abbreviations same as Figs, except color. R, red; A, amber; DR, dark red, or nearly black; Y, yellow, YR, yellow red.

NAME	Size	Color	Season	Mountain Region	Middle Region	Southern Region	Coast Region	REMARKS
							Worthless.	
Belle de Choisy	M	D R	M	•	•	....		
Belle et Magnifique	M	R	M		•	••		
Black Heart, Werder's	L	D R	E	....	....	....		
Black Tartarian	L	D R	M	•	••	....		Very early.
Black Eagle	L	D R	....	*	•	....		Cherries are uncertain in Middle region,
Beauman's May	L	R	E	••	•	....		• except in a few localities, where good
Carnation	M	R	M	•	•	....		crops are sometimes produced, the
Coe's Transparent	S	A Y	M	•	•	....		Morello class being most desirable
Early's Richmond	M	R	M	••	••	....		Trees should all be grown on Mahaleb
English Morello	M	R	M	•	••	....		stock.
Governor Wood	L	R	M	•	••	....		
May Duke	L	R	E	•	••	....		
Napoleon	L	R	M	•	....	....		
Rockport	L	A R	E	•	....	....		
Reine Hortense	L	R	M	•	•	....		
Wragg	M	P	L	••	....	....		
Yellow Spanish	L	R	M	••	••	....		

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QUINCES.

NAME	Mountain Region	Middle Region	Southern Region	Coast Region	REMARKS
Angers	....	•	....	....	Fine Quality.
Chinese	....	•	••	....	Succeeds best in Southwestern Georgia; good for preserving.
Orange or Apple	•	•	....	....	Most generally cultivated.
Portugal	....	•	....	....	Large and good.
Rae's Mammoth	•	•	....	....	

Quinces need strong clay soil. They are unproductive in gray land, except Chinese.

JAPAN PERSIMMONS.

(Diospyros Kaki.)

It is almost impossible to give an accurate nomenclature, owing to the confusion which exists in the collections imported from Japan. These collections seldom contain more than twelve varieties; yet when the trees bear fruit, the same name is often found to apply to several distinct varieties, or one variety has several names. The best and most distinct varieties have been included in this list, and with such synonyms added thereto as have been ascertained after several years' trial; and while no claim is laid to strict accuracy, the aim has been to reach this as nearly as possible.

All the varieties are hardy in the Middle and Coast Regions, and occasionally in the Mountain Region.

The fruit is usually of a bright orange red or vermilion, the color being more or less intense, according to variety, and begins to color when half grown, but should be allowed to hang upon the trees until just before frost is expected; or with the early ripening varieties until fully soft. If gathered before frost there is a slight astringency next to the skin, but this disappears after being kept in the house for a few days or weeks. If allowed to be slightly touched by frost, the flavor is much improved, but it will then not keep many days. It is, therefore, desirable to gather the fruit before frost, if intended for keeping, and then some varieties will keep until January or February. The flesh is soft, rich and sweet, and with a slight apricot flavor. The fruit should be eaten with a spoon.

Some varieties are apt to overbear, and should have the fruit thinned as soon as set in April.

Trees are propagated mainly by grafting upon the collar of the roots and upon the native species. Seedlings vary in size, shape and quality, but as the largest proportion are male plants, and those which are fruitful are apt to produce small and worthless fruit, very little reliability can therefore be placed upon seedlings, so far as yielding edible fruit.

Among, or Yemon (name of a Japanese ornament).—Round, flattened,

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deeply ribbed, dark orange red, and sometimes yellowish red, two and a half to three inches in diameter, average weight six ounces, and occasionally a specimen weighing sixteen ounces is produced. Very sweet, flesh red, and is edible while still solid; quality improves as it becomes soft. Maturity September to end of November. Trees of moderate height.

Hachiya ("Beehive" in Japansese.)—Synonyms: Costata, Imperial, Yomato, etc. Oblong, with blunt apex, slightly ribbed, two and a half by three inches; average weight five ounces. Flesh deep orange red; astringent while solid, but sweet and very good when soft. Should be house-ripened and can be kept until March. Tree of vigorous and tall growth.

Hiyakume (weighs one hundred "me," a unit of Japanese weight)—This is perhaps the most desirable of all the round, red fleshed varieties and as the fruit affects various shapes, it is known under many names, such as Pound, Tane-nashi, or Seedless, etc. The Agricultural Bureau of Tokio gives the latter name to a variety with black mottled apex, but we find both round and enlongated forms upon the same tree, as also uniformly orange and orange yellow colored specimens, while many are heavily tipped with black. The variation of forms and colors doubtless led to its array of synonyms. Fruit large, average three inches in diameter, and five ounces in weight; usually flattened, but elongated forms are quite common upon the same branch. Flesh bright orange red. Keeps very late. Must be soft before being edible. Tree of moderate height; apt to be of dwarf growth.

Ioyama Gaki (name of locality)—Medium to large, round but somewhat narrower at the apex; yellowish orange, with dark black pencilings at apex. Flesh dark brown or grayish brown; very sweet. Can be eaten when solid; four to six ounces.

Kurokume (This may possibly be Goshio-hira, or Palace Persimmon)—Very large, round, somewhat flattened; three to three and a half inches in diameter; average weight ten ounces, and sometimes yields specimens of sixteen ounces in weight; keeps late. Flesh red. Tree erect grower.

Miyo-tan—Synonym: Mazelli. Round or slightly oblong, two and a half inches in diameter; average weight five and a half ounces; slightly ribbed. Skin deep orange red. Flesh usually deep brown red; but bright red or half red and half brown fleshed specimens are often produced upon the same tree, the results of cross-fertilization by other varieties. Tree of medium or dwarf growth; exceedingly prolific. Fruit keeps very late. The brown fleshed specimens are edible while solid, and as early as Oct. 1.

Okame ("Stout young girl" in Japanese)—Synonyms: Oblong Hyakume, Mikado, etc.; medium to large, two and a half by three and a half inches; deep red; nearly always seedless; keeps late.

Tsuru-no-ko ("Stork Egg")—Synonym: Minokaki ("Persimmon from Mino," a locality.) Large, oblong, pointed, two and a half by three and a half inches; weight four to five ounces, sometimes ten ounces. Skin bright red; some specimens black at apex. Flesh red, very good. Keeps late; edible only when soft. Foliage long and shiny; tree compact and

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vigorous grower. This variety varies very much as to size at different seasons.

Yedo-Ichi ("No. 1," or "best in Yedo," latter being the old name of Tokio)—Synonym: Maru-Gata ("round shape.") Medium, round, some specimens slightly oblong, flattened at base and narrowing at apex, skin dark red, often with black mottlings near apex; flesh mahogany brown, with darker spots, brittle, and is edible while solid as early as October 1. Very prolific and bears fruit in large clusters. Tree an upright grower.

Zenji, or Zingi (name of Japanese village.) Small, one and three-fourths by two inches; weight three to four ounces. Flesh dark brown, with darker spots; very sweet. Edible as early as middle of September while still solid and lasts throughout October.

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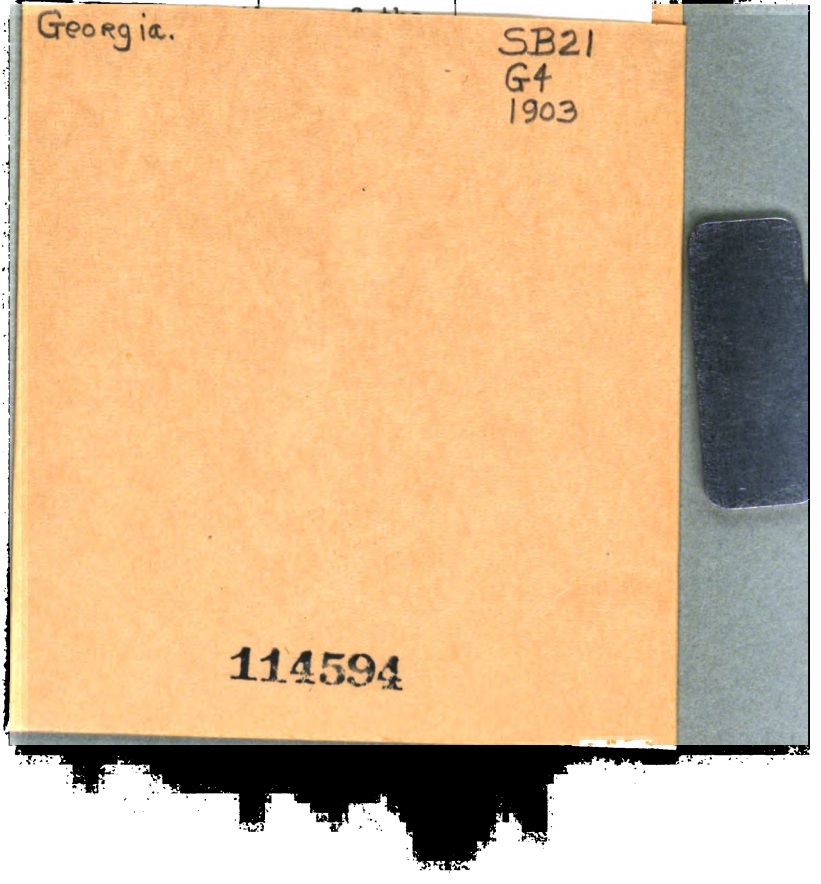

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